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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, January 6, 1894.

DAVID WILLIAMS, - PUBLISHER

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CINCINNATI.....Rooms 22-24 Pickering Building
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

An Annual Review.

We mark the beginning of the year by publishing brief reviews of the different trades with which the readers of *The Metal Worker* are concerned. These reviews are largely based on reports that have come to us from correspondents in all parts of the country, and therefore may be considered to fairly reflect the conditions prevailing throughout the United States. The year has been far from satisfactory in the majority of trades. The two causes generally assigned for the trouble are the silver disturbance of the early summer and the threatened tariff changes of the autumn. Public confidence was upset at the beginning of summer, and before it had time to recover itself the tariff agitation came to unsettle again the industrial situation. In spite of the disastrous experience of the year it is reassuring to know that the silver matter is not again likely to trouble the country, and that the disturbance from this cause has definitely ceased. The tariff question now remains for settlement, and we believe that it will be generally conceded that the chiefest evil in connection with this is the agitation of the subject. There are more manufacturers and business men who pray for a final and settled tariff than there are who pray for either high or low tariff. The evil effect that this disturbance causes is inestimable, and the United States will suffer untold losses if the duties are to be enacted and revoked and re-enacted, with all sorts of variations every few years. The prime element of prosperity is stability, and stability in values perhaps more than anything else. This cannot be so long as the imposts levied by the custom house are liable to frequent and great fluctuations.

A Word of Greeting.

We cannot let the season of the new year go by without offering to the readers of *The Metal Worker*, one and all, our good wishes for the year to come. It is usual at this time to make plans for the future, no less in a trade journal than in other lines of business. We hope to continue *The Metal Worker* in its upward course, and we have planned to provide our readers with a weekly publication which, we trust, will both interest and instruct them It will be our endeavor to increase its excellence in each and every department, and, so far as lies in our power, meet every want and fulfill every new requirement. We shall continue to depend largely upon the interest of our readers, upon their advice, suggestions and communications from them of all kinds. We will look for this assistance in the year to come, and we are persuaded that we will not look in vain. It is our wish to do the greatest good to the greatest number, and we are always glad to receive suggestions, even though they may be accompanied with fault finding. We will close this brief word to our friends as we began it—by wishing them a prosperous year.

The Fleetest Animal.

Through the aid of steam propulsion man has been able for half a century to travel swifter and, at the same time, more continuously than any other animal not capable of flying. It now appears that he is the fleetest animal—except some birds—when dependent for his propelling power solely upon his own muscular effort, and that he can maintain his efforts through a longer period than is probably sufficient to completely exhaust a horse, dog, deer or any other animal whose fleetness of foot is proverbial. The aid by which man as a self propelling animal has acquired the ability to distance the fleetest quadrupeds is the modern bicycle; and the extent to which this simple machine has added to his power of locomotion is shown by the astonishing records of the six-days' bicycle race in Madison Square Garden, New York City, which ended on the night of December 30, 1893.

Possibilities of Bicycle Travel.

The winner of the first place in this race—Schoch of Chicago—traveled 1600 miles in 142 hours, an average for the entire actual time of riding of a little more than $11\frac{27}{100}$ miles per hour. On the first day of the race, Waller of San Francisco made the marvelous record of 404 miles, being an average for the 24 hours, including all stops, of a little more than $16\frac{84}{100}$ miles per hour. It is not 30 years since such a speed would have been considered good on many railways. P. Berto made a single mile in 2 minutes $30\frac{3}{5}$ seconds, which has only been beaten by thoroughbred trotting horses, and the horse was never yet bred that could travel 50 miles in 2 hours 33 minutes and 53 seconds, a feat performed by Starbuck on the closing night of the race, being an average of a mile in 3 minutes $4\frac{4}{5}$ seconds, for the entire 50 miles, a feat probably never accomplished by any quadruped whatever. In view of these facts the possibility of a far more extended use of the bicycle as a means of propulsion does not appear so chimerical as it did a few years ago, when it was suggested that it might be of great use in effecting rapid military movements, and when experiments to demonstrate its value for this purpose were made in Europe. The bicycle of to-day, like most other things, is a very different affair from what it was a few years ago, and until it has been learned how to make and use a practical flying machine it is doubtful if any other method of traveling dependent upon the muscular power of man and affording the speed above recorded will ever be produced. It is probable, moreover, that the speed attained by the use of bicycles has not yet reached its limit, though it must have very nearly approached the limit, one would think.

Return Postage.

Many men who are punctilious in conforming to business usages often in writing letters to which they expect answers fail to inclose stamps to prepay postage on the reply. It would be better still to inclose an addressed stamped envelope with a written address. An inquiry will receive earlier attention and perhaps more careful attention if it involves but little trouble and no expense to the person addressed than if the latter is expected to do considerable work and foot the bill besides. This may seem a small matter—only 2 cents involved—but the principle of the transaction is apt to govern the person who is expected to reply. He is very apt to say to himself, "Well, if this man expects an answer he should at least have inclosed a stamp" There is very little danger of any one taking offense at such an inclosure. The inquirer who hesitates to inclose a stamp to a concern transacting a million dollars' worth of business a year because it is such a trifle may find upon reflection that the existence of that house depends upon an aggregation of two-penny profits. There are salesmen who at this time of the year are endeavoring to secure positions with other houses, and yet omit the inclosure of return postage on the reply which they unhesitatingly look for to their letter of application. If they receive answers to such unbusinesslike letters they are in luck, and they may be sure that something else has recommended them.

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than their correct observance of business civilities. The amount involved is of no consequence. Even if letter postage should be reduced to a penny, a stamp should still be inclosed to insure a reply.

Business Mortality in 1893.

Were it not that some important points can be gathered from the study of the statistics of business mortality in 1893 the subject would be promptly dismissed by those engaged in commerce, industry and finance. Post mortem examination is not pleasant, but may be instructive.

The two commercial agencies, *Bradstreet's* and *Dun's*, have made departures in their former methods in order to permit of the study in greater detail of the commercial failures which have taken place.

Dun's Review gives a classification showing separately the number, assets and liabilities in each State and section of manufacturing failures, trading failures, and "other" failures, including brokers and speculators. Besides they tabulate banks and financial failures, which are also classified. The aggregate results by sections are as follows, all former slave holding States being reckoned as the South, the three west of the Mississippi being called the Southwest and the States between Pennsylvania and the Mississippi being classed as Central:

	Manufacturing.		Trading.		Other.	
	No.	Liabilities. Thousands of dollars.	No.	Liabilities. Thousands of dollars.	No.	Liabilities. Thousands of dollars.
New England	482	$12,065	1,290	$14,820	24	$2,766
Middle	1,149	100,700	2,035	25,758	80	13,136
Southeastern	358	10,107	2,096	20,668	39	4,935
Southwestern	90	1,713	1,047	10,378	12	2,516
Central	664	28,139	1,387	19,682	55	6,452
Western	219	7,075	1,656	19,480	51	15,429
Pacific	264	4,908	1,172	9,269	41	1,428
Totals	3,226	$164,707	10,683	$120,055	302	$46,662

The following table shows by sections the total of banking and commercial failures together:

	Commercial.		Banking.	
	No.	Liabilities.	No.	Liabilities.
New England	1,798	$29,651,770	16	$12,546,000
Middle	3,263	139,594,553	35	43,478,618
Southeastern	2,493	35,709,419	82	22,119,514
Southwestern	1,149	14,606,509	61	29,703,776
Central	2,106	54,272,372	149	37,457,963
Western	1,926	41,982,422	218	39,554,298
Pacific	1,477	15,605,894	81	26,138,639
Totals	14,212	$331,422,939	642	$210,998,808

The banking and commercial failures together involved concerns whose aggregate assets were $497,443,700, while the liabilities amounted to $542,421,747. In addition thereto there went into the hands of receivers railroads whose total mileage was 25,375, representing a nominal stock interest of $674,412,487. It is estimated that their total indebtedness is $1,212,217,033, which amount exceeds by over $200,000,000 the aggregate bonded debt of the railroads failing.

Bradstreet's has somewhat different figures relating to business failures, since its totals include commercial, industrial and financial business failures, in which estimated actual assets are smaller than reported liabilities. Thus they do not include 240 banks, whose aggregate liabilities amounted to about $80,000,000, as contrasted with assets of $100,000,000. In this way the business failures figure up to $402,427,818 for the liabilities, against $262,417,532 assets. The proportion of the latter is greater than ever before, being 65 per cent.

When it is considered how enormous is the shrinkage in values of stock and assets of those concerns which have weathered the storm some faint conception of its destructive effects may be obtained. There were 1,050,000 firms, corporations and individuals in business in 1893, of whom 15,560, or 1.50 per cent., failed. The records of losses cover only that small percentage. How infinitely greater must be the losses of the survivors!

Sense and Nonsense.

BY A. D. F.

Since the days of Solomon men have taken pleasure in proving and likewise in disproving his saying that "There is no new thing under the sun." The lawyers go back to ancient Rome for the maxims of their trade, and now they are unearthing clay tablets from Assyrian ruins with the records of deeds and other legal forms; perhaps some day they will find the quitclaim Adam gave on leaving his beautiful country place. We know they had strikes when the pyramids were building and the old magi of Persia man anticipated our schemes and has quietly kept them at work in her characteristic fashion without asking advice or giving it. Is it not a gratifying thought to the hot air furnaceman, and the maker and setter of hot water heating apparatus to consider that their methods of warming houses have been practiced on a stupendous scale since the creation of the world? The furnace at the equator sends up its column of hot air to the first floor of the heavens, and the mighty trade winds furnish the cold air supply drawn from the tropics of Cancer and Capricorn, and which flows to the equatorial furnace without the aid of any wooden or sheet metal box.

And what is the Gulf Stream but an enormous flow pipe warming the whole of Europe? In the details of her apparatus Nature has not followed modern methods in every particular. She uses a combination heater of her own devising, and which embodies certain curious features. Her hot water system is not an independent apparatus, but relies upon the heating of the air for its operation. The Gulf of Mexico is only a secondary heater; it is the trade wind from the West of Africa that starts the water flowing to the Gulf, where it twists about for a while and then begins its northeast journey across the Atlantic for the benign purpose of keeping Europe from freezing to death. Were it not so, England would be alive with reindeer, Scotland a pasture for Polar bears, and hordes of Eskimo would be chattering on either bank of the Rhine and waging war for the possession of Alsace.

The big heating system for the house of the world is operated from one central fire pot, the sun, and with the wastefulness that Nature is guilty of in all her works there is no use made of conducted or convected heat. Only the radiant heat reaches us through space, to be transferred to air and water through convection from the earth. How contrary to our notions of thrift is this prodigality of warmth, with the sun shining day and night throughout the round of infinite space and this little earth of ours intercepting but the smallest fraction of it, all the rest, so far as our comfort is concerned, wasting itself on the cold sky. But some day Nature will be bankrupt and find that she cannot meet the coal bills of the sun. Then we'll be in a pretty pickle; we'll wake on a fine July morning to a November sun, August will bring with it winter weather, before the fall is half done we'll have burnt up all our coal, and by Thanksgiving we'll be crawling down volcano craters to huddle around the subterranean fires. The next spring this earth will be as dead and frozen as the moon, and astronomers on the planet Mars will be aiming their telescopes this way and wondering if the Washington Monument is only an icicle or the Ferris Wheel a part of an incompleted bicycle.

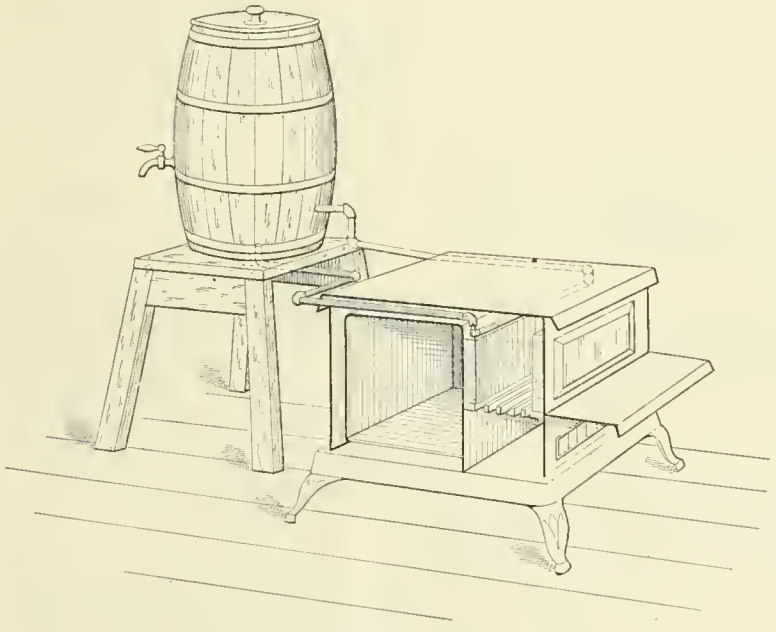
But there is no use in worrying over what may happen next summer, or any other summer for that matter. The bank account of Nature is still good, so far as we know, leastwise she hasn't stopped shoveling fuel into the sun, so the trade winds will keep on blowing, the Gulf Stream will continue to thaw England into verdure, and steam and hot water, furnaces and stoves, open grates and Baltimore heaters will give warmth and occupation for many years to come.

THE LETTER BOX.

A Plan for Heating Water.

From J. S., *Vincentown, N. J.*—I have a customer who wants plenty of hot water for dish washing at a country hotel, and does not want to interfere with the cooking. There is no water supply except from a pump, and his stove is an old fashioned flat top cook. He does not want to spend money for a new stove, a tank and a force pump, but thinks that a Yankee ought to be able to meet his case. So I make application to *The Metal Worker* for assistance.

Answer.—A supply of hot water that has been found satisfactory in similar cases has been obtained by the following plan, as shown by the cut: A pipe connected with the pipes in the stove, being careful to have a slight descent from the bottom of the barrel to the fire chamber, and a slight ascent from the fire chamber back to the side of the barrel. The more direct connection should be made to the side of the barrel. A faucet should be placed about 10 inches above the bottom of the barrel so that there will be no possibility of the barrel becoming empty. The barrel can be filled by a bucket nearly to the top, leaving some space for the water to expand as it is heated. A wooden cover should be made for the barrel. If steam is made



A Plan for Heating Water.

water back is made for the stove, special ells being used for the purpose. One pipe enters from the back of the stove, just above the top of the oven, and runs across it to the first chamber, with a drop ell. Then along the fire chamber to another ell and from it across the oven on the other side and out of the stove. If the special drop ells cannot be secured readily, two more ells should be used to drop the pipe that runs across the fire chamber so that it will not choke the draft. The fire bricks should be cut down in hight, to let the pipe back so that it will not take up fire space. A stand should be made to support a good oak barrel a few inches above the top of the stove. From the bottom of the barrel a pipe should be taken that has been connected by asbestos washers, red lead and jam nuts. About 6 inches above the bottom of the barrel another pipe should be taken from the side. These two pipes should now be in the kitchen a pipe can be run from the side of the barrel, near the top, to the chimney to carry the steam off.

Green Water from Copper Tank.

From H. M. K., *Cortland, N. Y.*—Referring to letter from "J. H. S.," Richmond, Maine, in *The Metal Worker*, December 23, about the water in copper tank turning green, I want to give a little of my experience. I made a new copper tank for a range, and in a few days I was asked to send my workmen there to see what was the matter with the cistern water, they complaining that the water turned green as soon as soap was used in it. My man went and looked at roof, conductors, &c., and examined cistern. The water was clear and good; went to the range, lifted the cover to reservoir, took out a dipperful of water, poured into wash basin, took a piece of soap and tried it; result, water turned green at once. Took a dipperful of cistern water, cold, and tried it and it remained clear. The trouble, then, must be in the tank. Could not account for it. After a careful examination I became satisfied that the coal gases reached the water where the wire in top of reservoir was sprung away from the casing. I bent back the wire around the top to its place and filled the crack around the top with stove putty, and solved the problem and had no more trouble. Had never heard of such a case in my life. And so we hardwaremen and tinkers learn something new every day.

Good Wiping Solder.

From E. E. H., *St. Louis.*—I would like *The Metal Worker* to settle a difference of opinion by giving the materials and proportions used in making good wiping solder for plumbers. Is anything used besides tin and lead?

Answer.—Good wiping solder as universally used is composed of tin and lead only. A solder that has been much used is composed of 2 parts lead and 1 part tin, but a better solder and one that makes brighter joints is made of 60 parts lead and 40 parts tin. In actual use the proportion varies with the plumber, some using more and some less tin. The more tin that is used the quicker the work must be done and the better the joint that is made.

Pressure Supply and Piping to Boiler.

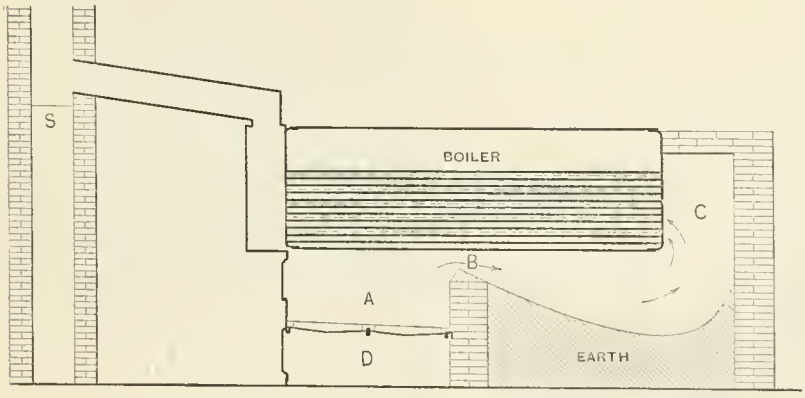
From J. M. S., *Hinsdale, N. Y.*—I have a range boiler to set and would like *The Metal Worker* to answer the following questions and give the reason for them: Water is to be supplied to the boiler from a tank over the kitchen, and hot and cold water are to be supplied to a bathtub and wash basin and for use in the kitchen. I will have to run a pipe from tank to boiler. Would it be best to run this supply down into the cellar and tap it there to supply the tub and basin and then continue it up to boiler, or should I put in a separate pipe from the tank to supply them with water? Would there be sufficient pressure to keep the boiler full and supply the other fixtures with water if only one pipe is taken from the tank? Is it necessary to extend either the cold water inlet or the hot water discharge down into the boiler, and how far for each? The boiler is to be heated by a water back in a range, and ¾-inch pipe is to be used throughout. Is this correct for the different pipes?

Answer.—It is not necessary to have a separate pipe to supply the boiler with cold water, and a branch from the pipe that supplies the other fixtures will answer every requirement. Just as long as there is water in a tank placed above a boiler the water will run down into the boiler, though when a cock is opened on the same pipe the pressure will be slightly reduced, but not enough to cause trouble. The cold water pipe should extend down by means of a tube into the boiler to within 6 inches of the bot-

tom, and the tube should have a hole in it ⅛ inch in diameter at the top to prevent siphonage. This tube delivers the water to the boiler without permitting it to mingle with and cool the hot water at the top. The hot water discharge should not extend down into the boiler, because the hottest water is at the top and should be allowed to escape at once. There will be no trouble from the use of ¾-inch pipe, though ⅝-inch is more generally used for economy both of water and material, as it supplies water fast enough to be satisfactory for household use.

Remedy Wanted for Poor Draft.

From A. W., *Geneseo, Ill.*—If "E. O. H." of Rock Valley, Iowa, whose inquiry appeared in *The Metal Worker*, December 16, will carry out the following suggestions I am sure he will have a good draft to his boiler, provided his chimney flues are entirely independent of each other and are fully as large at the top as at bottom and full size all the way up, and that he uses only one of the flues in the chimney. When both flues are used for one fire the tendency is to work like an inverted syphon, and the air comes down one flue and up the other and spoils the draft from the boiler or fire. See that the area of the flue at the bridge wall at B, in the accompanying sketch, is less than the area of the chimney flue. Then increase the area gradually until the space at the rear of the boiler is fully twice the capacity of the chimney flue, so as to make an easy turn into the boiler flues at C. Connect the smoke pipe to only one of the chimney flues; and it is a good plan to stop off this flue directly under where the smoke pipe enters it, to prevent the damp air from the ground interfering with the draft. This can be done by a sheet iron slide at S, and it can be drawn out occasionally to clear the flue above. See that there are no air leaks, either about the boiler or base of chimney into the flues.



Remedy Wanted for Poor Draft.

What Caused the Explosion.

From C. I. L., *New Jersey.*—Please inform me what caused the explosion which I describe. When a summer residence here was closed, all the water was drawn out of the pipes and the water shut off to prevent freezing. Recently a servant was sent to prepare for a short visit by the family, and built a fire in the range, and later on when some water was needed it was turned on by opening a stop cock in the front cellar, but before the servant reached the kitchen a terrific explosion occurred. The water back was thrown out through a window 50 feet across a garden, the brick jamb at one side of the range was torn away, the range was demolished, the ceiling was shattered, the windows were broken, and coals were thrown all about the kitchen. A fire was prevented by the broken pipes sending water in every direction. I was called in to make the repairs, and would like to know what made the trouble.

Answer.—The explosion was caused by water entering a water back that was possibly red hot, when steam was instantly made of such great expansive power that it not only burst the water back but spread everything that tended to confine it. To use a fire against a water back that has no water in it is likely to crack the water back through expansion or melt the solder on the pipe connections, or make leaky joints when iron pipe is used. To turn the water into a water back lying in a good hot fire is always extremely dangerous, and some severe personal injuries and wreck of property have resulted from doing it.

Wants the Plumbers' Opinion.

From B. & S., *Greenville, S. C.*—We are in a controversy with another plumber, also our plumbing inspector, as to the advisability of putting in a running trap and fresh air vent in the house drain leading to the public sewer. We have always used a running trap and air vent in all of our work. We also see in all city plumbing rules this trap mentioned.

We have a sanitary sewer only, with plenty of fall and automatic flushing tanks at the head of each sewer. Manholes are also placed at the intersection of streets, with perforated covers for ventilation. The sewers are made of regular sewer pipe from 8 to 20 inches. In connecting with this sewer is it advisable to use a running trap and air vent? Would like to hear from the trade on the subject.

Boston Plumbers' Paste.

From L. W. T., *Rockport, Mass.*—In *The Metal Worker*, December 23, I saw an inquiry for Boston plumbers' paste. The paste is made as follows: Take flour and cold water and mix quite thin and beat all the lumps out; sprinkle in a little pulverized alum, which will preserve the paste a month or so; thicken over a fire, but not too quick. In using the paste for a round joint after the ends of the pipe are shaved and greased, cut a strip of paper an inch wide and fasten to the pipe with the paste. On a branch joint the branch is treated the same way, but the main pipe is not papered; the paste alone is rubbed in; then the pipe is shaved and greased. After the joint is wiped a damp cloth will remove the paste from the pipe not papered. By cutting across the paper that is put on, with a knife, it can be readily removed if the pipe has been greased under it. If "W. F. S." tries this I would like to hear from him through *The Metal Worker* how he likes it. Those who apply to the "Letter Box" for assistance should report their success with the remedies suggested and given.

From DAVID SMITH, *Boston.*—The paste about which "W. F. S." inquires in *The Metal Worker*, December 23, is called Noah's paste, and is made by the Boston Paste Company, 46 Beverly street, Boston, Mass. It is used by many plumbers all through this section just the same as soil with general satisfaction.

From X. Y., *Bridgeport, Conn.*—Answering the inquiry of "W. F. S.," Bayfield, Wis., which appeared in *The Metal Worker* of December 23, would say that if he will use common, ordinary, every day flour paste, such as used by paper hangers, he will have no trouble.

Location of Air Supply.

From J. W. S., *Paterson, N. J.*—I see in *The Metal Worker*, December 30, that "W." of Warsaw, N. Y., cuts "Snips," whose letter appeared December 2, short by telling that if he will figure the capacity of a 10 x 14 register, less the grating, he will find that it has no more capacity than a 10-inch pipe. Now, I think that if "W." will figure the register and pipe correctly he will find that the 10 x 14 register has an area of 16 square inches more than the 10-inch pipe.

Pipes From Tank.

From G. F. W., *Grandy Center, Iowa.*—In answer to "M. T. C.," Riverside, Cal., whose inquiry appeared in *The Metal Worker* of December 23, I would suggest that he run his 2-inch overflow pipe into the bottom of the tank and attach an outlet valve to it in the bottom of the tank, and use a float attached to the valve so as to open the valve when the tank gets full. By so doing he gets the same direct pressure on the overflow pipe as he does by opening the stop cock at A. On account of the way he has his overflow it gets air trapped, and having no direct pressure it is easier to flow over the top of the tank than down the overflow pipe and work against the air trap. By letting the water into the overflow pipe at the bottom of the tank no air will get into the overflow pipe, and therefore air trapping will be avoided.

Address Wanted.

From SHIELDS & GREER, *Greensburg, Pa.*—We wish some one would furnish us the name and address of the firm manufacturing a ram or pump for drawing water. The concern we want to get the name of is located, we think, in Pulaski, Va.

Tidings from the Canadian Northwest speak of acute distress among the farmers in that region, where the crops were a partial failure.

PLUMBING and GAS FITTING.

Review of the Plumbing Trade.

THE year 1893, which proved so disastrous in many lines of trade, has not left the plumbing industry untouched. Reports from our correspondents in all parts of the country indicate an almost general falling off in the volume of business done during the year, with an even more than corresponding decrease in the margin of profit, owing to keener competition. This falling off in business was, however, almost wholly confined to the latter half of the year, as the first six months yielded generally fully as much business, if not more, than that of the previous year.

Business in the West.

This fact is more particularly brought out in reports from the Western States, which speak largely of a very favorable opening and a volume of business preponderating materially over that of 1892, until about July 1, when the general wave of financial stringency which swept over the country, by causing the abandonment of building operations, or the postponement of contemplated improvements, brought with it a sensible decrease in plumbing jobs. A report from a correspondent in Salt Lake City, Utah, speaks of the prospects in the early spring as having been favorable for the best season that had been experienced for many years, but the depression above referred to caused a complete cut-off in the volume of business. A similar experience seems to have been common to the trade in general.

Business in the East.

In the East the jobbing trade has been severely struck, and more than one report mentions a diminution of business to the extent of more than one-half, while the competition has proved the severest ever yet experienced. In the smaller and jobbing trade this feature has been intensified by the fact that quite a number of new shops of the smallest description have been started by journeymen out of employment, who, to quote a New England plumbing firm of high reputation:

Take every little repair job that they can get hold of at the closest prices, having thus subdivided the business to such an extent as in some cases to cause almost ruinous competition. These small tradesmen compete against each other on every little contract or repair work, the job eventually being taken by some one at such a price as to entirely preclude any prospect of profit.

Business in the South.

In the South plumbers have fared rather better than their brethren in other parts of the country. The financial stringency not having been so oppressive in that section, the general run of business has not been falling off to anything like the extent that has generally marked its course elsewhere. Southern reports, as a rule, speak of a better volume of trade than that of 1892, although business has been done on a closer margin, and a larger amount of personal exertion was required in working it up. And, even in the South, many contracts in plumbing have been lost in consequence of the abandonment of building operations and the lack of ready cash.

Collections.

Collections have been much more difficult during the latter half of the year and particularly toward the close. This is spoken of as one of the most unfavorable results to the plumbing trade of the general financial depression. Employing plumbers have, in many cases, found it extremely hard to collect their outstanding accounts and to obtain the means of paying their workmen.

Cheaper Goods.

Owing to the hard times, a general disposition has been shown toward the use of cheaper goods where repairs or fittings were absolutely necessary. This indicates merely the fact that such repairs were only intended to be of a temporary character, and would be eventually replaced by more substantial articles. No one has had any money to waste on mere luxuries, and, as a general rule, particularly within the last few months, such plumbing work as has been carried out has been only of an absolutely necessary nature.

The Outlook.

The outlook is more or less shrouded in the mist of uncertainty, and, of course, depends mainly upon the encouragement or otherwise given to investors to put their money into building operations. A great deal of work in this line is pending, and will be undertaken immediately the promoters think that they have any grounds for confidence in the financial situation. Architects are reported to hold quite an accumulation of work ready to be undertaken so soon as the necessary encouragement is afforded. This should mean a good year for the plumbing trade, provided the confidence of the public is restored within a reasonable time. The majority of observers in the trade do not, however, look for any great revival before the spring at the earliest, and possibly, if the discussion of the tariff and other kindred questions is prolonged beyond that time, the stagnation may continue well into the summer. A valued correspondent in the West writing to us makes the following trite observations:

If the people would do less talking about politics and put their shoulders to the wheel of their business, in a short time they would find out that they are not in such bad shape after all.

And this probably contains the truth as to the cause of the greater part of so-called trade depression. The work done by the plumbers during the year is generally spoken of as maintaining that satisfactory improvement which has marked the past few years.

Trade Schools.

The advantages offered by the trade and other training schools, especially those well known establishments in New York, Philadelphia, Brooklyn and other Eastern cities, is being more fully recognized both by employers and employed. Their records for the past year or two show a constantly increasing number of applicants for instruction, and in every case the plumbing classes have proved the greatest attraction. Students in these classes outnumber by far those in any other line of trade. The results of the thorough training received by the graduates of the New York and other trade schools is demonstrated by their success in their several lines of businesses, and in none has this been so marked as in the plumbing trade.

Associations of Master Plumbers.

The National Association of Master Plumbers continue their good work of organizing the trade and bringing the members into closer social and business relationship in the various cities. Several new local associations, under the auspices of the National Association, have been formed in the towns and cities of the Union during the past year. The organization appears to have worked most harmoniously, and is yearly becoming more recognized as a highly successful association. One good feature which has been directly introduced by its meetings is a more friendly rivalry between competing concerns in place of the bitter and cutthroat measures that were formerly too often adopted by rivals in the trade. This has been largely brought about by the social features of the association, which, bringing men together out of business, have given them friendlier feelings toward each other in business.

The use of poor and cheap ma-

erials in contract work is becoming less common, and on every hand a marked improvement is noted in the manner in which the conscientious performance of contracts is carried out. A better quality of material is used every year, and a larger amount of care is bestowed upon the work done.

Plumbers' Supplies.

Despite the prevailing depression of the year, manufacturers of and dealers in sanitary fixtures and plumbers' supplies are able, in a number of instances, to render quite cheerful reports of the aggregate volume of trade in their goods, although the mention of curtailed business toward the close of the year is almost unanimous, and the tale of a declining margin of profits—except in the case of a few patented specialties—may be said to be quite general throughout the trade.

Competition and Profits.

Competition has been becoming sharper every year of late, and the one just closed has proved no exception in this respect. The comparative dearth of orders which obtained in many quarters during the greater part of the year stimulated, indeed, a still keener rivalry among manufacturers. Profits were consequently brought down to the narrowest margin. In some cases the assertion is made that, in order to get cash and business, goods were not only sold at less profit than ever before, but in several instances actually below cost. This was not the case in the early part of the year, when business was moving briskly and giving promise of an excellent trade showing for 1893, until the financial panic broke in rudely upon the rosy views of manufacturers.

The effect of the financial stringency on his business is thus described by a large manufacturer of sanitary goods in the West:

Up to July 1 our business was excellent and displayed an increase over last year of about 30 per cent. Up to that time we were running on full time, 10 hours a day, with a full complement of men. Since then we have been gradually cutting down both the number of days and hours, and for the past two months have been running on less than half time. The aggregate business done for the year has been about 26 per cent. less than that of 1892.

Improvement in Goods.

Although there has not been quite as large a line of absolute novelties in sanitary goods or appliances introduced in the past year, the tendency toward improvement in those goods is quite as marked as in previous years. The quality of plumbing material and fittings all along the line constantly improves, and consumers get much better goods for their money than ever before. In this connection, one of the largest houses in the Eastern trade reports as follows:

The plumbing goods demanded for all classes of buildings tend to an increase in quantity and an improvement in quality. This has been the case for the past few years, and is leading up to a very much improved style of plumbing fixtures.

Meanwhile the practice of more economy in manufacture and somewhat cheaper raw material have combined to enable manufacturers to place their highest class goods on the market so much cheaper as to insure a large increase in the use of them in preference to the cheaper grades.

Failures in the Trade.

The year has been marked by the bringing down of a number of concerns in the plumbers' supply trade, the basis of whose business standing was not sufficiently secure. On the bearing of this question toward the general trade the following remarks made by a member of one of the largest manufacturing concerns in New York State are worthy of consideration:

If we had a severe national bankrupt law, or a severe and better State bankrupt law, we could have weathered the panic in a better manner. Our present law does not protect the honest merchant who pays 100 cents on the dollar, but fosters mushroom concerns which generally fail disgracefully and which during their existence injure the honest and reputable houses. These mushroom concerns not only bring prices down to cost and far below, but run down the quality of goods to a deplorable level. Such firms fail, generally make no settlements, and, although their failures are known to be dishonest, the parties thereto are so well protected by our laws that they frequently start in business again and renew their career of fraud. If we had severe laws these so-called pools, trusts and combinations would not exist to the extent that they do at the present time; but these so-called combinations, &c., are an absolute necessity so long as we cannot have good laws, otherwise many houses would cease to exist. My experience in combinations is that manufacturers generally desire but a remunerative profit, as they realize that excessive profits would but kindle new competition. Many houses knowingly and willfully sell below cost, then fail or settle for a small percentage and go on unpunished. Is this just for the ones who strive to pay 100 cents on the dollar?

An increase in the number of bad debts is a feature in the accounts of several plumbers' supply houses which is loudly complained of.

The experience of a very prominent house in the trade, which is in correspondence with that of others, was that these uncollectable accounts reached 3 per cent. on the sales of 1893, as against ⅓ per cent. in 1892. Another concern in the East writes on the same subject as follows:

The so-called financial stringency had the effect of tying up a large amount of our bills and accounts receivable. How much of this will prove total loss we are not in position to know at this time. The indications are that a large proportion will have to go to profit and loss account. It is our opinion that in nearly all cases in which our customers are financially embarrassed the trouble has been caused by doing too much business with small capital. The profits in our line have been so small in the past two years that liabilities could not be reduced. The financial difficulties also had the effect to show the true standing of many concerns who formerly had good credit, but since forced to make statements of their condition it has been found that too much credit was extended. Therefore very little change for the better can be expected until a more profitable business will be the rule.

In short, those concerns that have, during the past few months, done business on the most cautious and conservative lines, have come out best in their balances at the close of the year.

Prospects for Sanitary Goods.

The outlook for the trade in sanitary goods and plumbers' supplies in the earlier months of 1894 is, by general consent, regarded as very unsatisfactory. In fact it is thought that a still lower point of depression will be reached before the spring, and that no material revival of business can be looked for during the first six months, unless some unforeseen combination of circumstances shall, in the meantime, encourage capital to seek investment in building. Stocks of manufactured goods are unusually low everywhere, and these are not being supplemented to any material extent, as manufacturers generally are unwilling, under present conditions, to put out more goods than are actually salable. Consequently an advance in prices would be more than likely to follow any largely increased demand. Apparently there is a large amount of building contemplated for this year, and although much of this may be abandoned or postponed, the chances are, the tariff and other disturbing questions being settled, that the latter half of the present year may see a wonderful restoration of activity in the trade.

Sanitary Goods in Canada.

The causes which brought about the depression in this country last year have not operated to the same extent over the border, judging from reports received from the Dominion of Canada. Business in sanitary goods is there spoken of as showing an increase for 1893 of from 10 to 40 per cent. on sanitary specialties. Competition, moreover, has not proved excessive, and the margin of profit, though tending to decline, has been of a satisfactory character. The outlook for this year's trade is regarded as bright, and it is hoped that 1894 will lead previous records.

Massachusetts State Association of Master Plumbers.

Secretary Daniel Shannon of the Massachusetts State Association of Master Plumbers is sending the following invitation to the plumbers throughout the State for the annual convention:

"The third regular convention of the Massachusetts State Association of Master Plumbers will be held in Elks' Hall, 24 Hayward place (near Globe Theater), Tuesday, January 9, 1894. Local associations are requested to elect delegates and send a strong representation from their districts. All master plumbers legitimately engaged in the plumbing business in our State are cordially invited to attend and affiliate with us. The Boston association has made ample provision for the comfort and entertainment of a large number, and it is hoped the brethren of the craft will avail themselves of this opportunity to enroll under our banner."

An enjoyable feature of the gathering will be the concert and ball in the evening, which the ladies will attend.

Boston Master Plumbers.

At a regular meeting of the Master Plumbers' Association of Boston and Vicinity, held recently at Boston, the following officers were elected for the year 1894:

J. Warren French, president.
David Smith, first vice-president.
H. H. Collins, second vice-president.
Charles M. Bromwich, third vice-president.
W. A. Tucker, recording secretary.
E. C. Kelly, corresponding secretary.
J. W. Cosden, financial secretary.
Daniel Shannon, treasurer.

AUDITING COMMITTEE.

John Crawford, P. H. Winn, J. O'Connell.

LEGISLATIVE COMMITTEE.

G. C. Forbes, J. F. Davlin, Isaac Riley, T. H. Duggan, T. E. Sharpe.

SANITARY COMMITTEE.

T. J. Tute, F. A. Titus, James Tucker, W. N. McKenna, C. J. Mansfield.

ARBITRATION COMMITTEE.

John Crawford, H. H. Collins, J. W. French, David Smith, J. F. Buerkel.

APPRENTICESHIP COMMITTEE.

Chas. J. Linnehan, I. N. Tucker, W. A. Johnson, James Crawford, J. J. Kelly.

TRAPS AND VENTS.

THE BANQUET held by the New York master plumbers at Jaeger's restaurant on the night of December 23 was a very enjoyable affair. About 200 were present, presided over by Col. George D. Scott, and ample honor was paid to an elaborate *menu*. The feature of the occasion was the presentation of a handsome gold watch chain and locket to President Henry G. Gabay, as a token of the esteem in which he is held by his brother plumbers and an evidence of their appreciation of his labors in their behalf. The presentation was made by John Byrns in a graceful speech, and was received with grateful surprise by the zealous president. Congratulations, toasts, speeches, good wishes and good cheer left nothing wanting to make the event as merry as the season.

AT A REGULAR MEETING of the Pipers,' Plumbers' and Metal Workers' Union of Portland, Maine, recently held, the following officers were elected for the ensuing year: President, D. E. McBride; vice-president, F. McDermott; recording secretary, Gus Smith; financial secretary, James Reagan; treasurer, Thomas McBride; conductor, R. P. Berry; warden, R. P. Merrill; grand deputy, P. A. Mahoney.

AT A RECENT TOWN MEETING in Clinton, Mass., some changes were made in the plumbing laws, the more important being that a plumber must make, free of charge, any changes in work done by him that will not satisfy the inspector, and that the Board of Examiners and not the Board of Health have power to revoke licenses. A provision to fine a plumber $50 for violating the laws was defeated.

THE PLUMBERS of New Jersey are taking steps to present to the Legislature, about to convene, a bill providing an examining board of plumbers.

JOSEPH BACKES, Point Pleasant, N. J., has moved his large plumbing and gas fitting business from the Hendrickson Building to the new Huss Building, where he has more commodious quarters especially arranged for his convenience.

THE GLOVERSVILLE, N. Y., Plumbing Board has elected the following officers: President, H. C. Sowle; secretary, T. F. Mullarkey; treasurer, E. B. Baker. The board has granted plumbers' licenses to the following: H. C. and J. E. Sowle, Mullarkey & Senior, Haggart & Treadway, Wm. H. Demarest, Treher & Knott, William Huggett and C. P. Buschmann.

E. E. HAY now carries on the plumbing business at 2110 Clark street, St. Louis, Mo., formerly run by the firm of Hay & Leary, who have dissolved partnership.

THE MASTER PLUMBERS of Boston and vicinity have selected to fill one of their offices T. J. Tute, ex-treasurer of the National Association of Master Plumbers.

A NOTICE IS ISSUED to the trade under date of January 1 that the Smith & Winchester Company, 19-37 Wendell street, Boston, Mass., have purchased the stock, machinery, good will, &c., of the business formerly conducted by Smith & Winchester and will greatly increase their facilities. It is their intention to carry a full and complete line of goods in the steam, gas, water and plumbing trades. The company will be under the same management as their predecessors.

SECRETARY DAVID SMITH of the National Association of Master Plumbers has been elected one of the officials of the master plumbers of Boston and vicinity for the ensuing year.

A CALENDAR POSTER of exceptional size is sent out by F. E. Myers & Brothers of Ashland, Ohio. It is 4 feet or more in length and a couple of feet wide, showing at the top a general view of the company's works at Ashland, a reproduction of the World's Columbian Exposition award, and then follow prints of a very large number of pumps of all sorts which the company make. The lower part of the sheet carries similar illustrations of hay tools. The calendar is in 12 sheets, fastened to the middle of the poster. Accompanying the calendar is a very pretty circular note addressed to the trade, calling attention to their goods.

JOSEPH COOPER has leased the basement of the Post Office Building at Pontiac, Mich., and will occupy the premises with his stock of plumbing goods and workshop.

JAMES E. SMITH, plumber and gas fitter, has retired from business at Gloucester, N. J., and given the control of his extensive trade to his two sons, James and John.

F. C. BOOTH, a Bridgeport, Conn., plumber, was seriously burned about the face by the explosion of a lamp recently.

THE ABEL-GERHARD PLUMBING COMPANY were recently incorporated at St. Louis, Mo., with a capital stock of $25,000, all paid. Frederick Abel holds 124 shares, Oscar J. Gerhard 124, and Walter C. Abel two shares.

YARRINGTON & MCCABE have leased a store in Lewis' Block, at Birmingham, Conn., and have started in the plumbing business.

A LOCAL UNION of plumbers, gas and steam fitters was recently organized at Manchester, N. H., after which a banquet was served. Daniel O'Connell and Garrett Cotter were elected president and secretary.

SMITH & WINCHESTER COMPANY, Boston, Mass., issue advance extract pages from their 1894 complete catalogue of plumbing, steam, gas and water supplies. The few pages at hand show several interesting articles in the plumbing line. The first is Moore's patent Primrose basin combination; then come laundry tubs, kitchen sinks of various sorts in porcelain, pantry sinks, slop hoppers, &c. The Charlesgate syphon closet is noticed, likewise lavatories and other specialties.

A. Y. MCDONALD & CO., 168 Lake street, Chicago, manufacturers of and dealers in plumbers' supplies, sanitary specialties, pumps, steam and brass goods, have issued a fine wall calendar for 1894. The main feature of this calendar is a beautiful picture, lithographed in colors, artistic in conception and unusually well executed. Attached to the lower part of the picture are leaflets for each monht. The company's card is modest and inconspicuous.

J. S. TRIMBLE, the senior partner of the firm of Trimble & Lutz of Wheeling, W. Va., and an uncle of E. D. Hornbrook of Kansas City, Mo., died at his home in Wheeling, W. Va., December 23, 1893, in his sixty-third year. The business of which he was a partner is a leading plumbing, steam heating and mill supply house in the State, and will be continued in the old name and under the management of Geo. W. Lutz, the junior member of the firm.

Treatment of Lamps.

The Philadelphia *Times* gives the following practical directions for the maintenance and care of lamps, so as to obtain from them their maximum efficiency: Lamp wicks should have the charred part rubbed off with a rag kept for that purpose. They should very seldom be cut. They should not be used so long that the webbing becomes tight and non porous.

Lamps should be kept filled with oil. It is bad for the wick and burner when the oil left over from one evening's reading is made to do duty a second time.

The tank should be filled again.

About once a month the wick should be removed, the burners unscrewed and boiled in a little water in which common washing soda has been dissolved. This will remove the almost imperceptible coating of dust and grease that forms on the brass.

The lamp chimney should be washed in warm, soapy water each day, a mop made especially for such work being used. When dried it should be polished with soft newspaper or chamois.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until January 23 for the interior finish, plumbing, gas piping and approaches for the United States Post Office Building at Lewiston, Maine. Drawings and specifications may be obtained from the Supervising Architect, Washington, or from the superintendent at Lewiston.

The Pennsylvania Sewer Pipe Works, Huntingdon, Pa., closed down on Saturday last for 30 days in order to carry out some extenaions, with the view of increasing the capacity of the works.

Railroad interests seem to have been peculiarly hard hit by last year's financial disorders. The tale of railroad troubles for 1893 shows more receiverships than during the previous ten years, while their individual importance was even more remarkable.

Sheet Metals and Sheet Metal Machinery.

Manufacturers of sheet metals and sheet metal goods, with one consent, testify to a year of contracted business and dwindling profits. This has been particularly emphasized in the sheet iron trade, where competition has been of the fiercest character. So much has this been the case that one of the largest sheet iron and steel manufacturers in the Eastern States reports that many mills have been willing to take orders at any price in order to tide over the depression, with the natural consequence that some have gone into receivers' hands, thus becoming still sharper competitors.

Sheet Iron and Steel.

Prices of black iron have been utterly demoralized, and practically whatever consumers might choose to offer. For the last few months of the year producers were generally constrained to restrict their output very materially on account of accumulating stocks which could not be disposed of at the hand to mouth system of buying lately in vogue. Galvanized sheet iron has not fared as badly as black, the demand having continued fair throughout the year and the production limited. In general trade was satisfactory up to the fatal first of July, being in some cases described as equal to that of 1892 and in others as exceeding it. With the advent of the panic, however, the demand for sheet iron fell of anywhere from 20 to 50 per cent. and continued at a low ebb to the end of the year.

Profits on Sheet Iron.

Profits are spoken of as being of an infinitesimal nature where the balance has not, indeed, come out on the wrong side. The prospects for the earlier part of this year are generally regarded as bad, with complete uncertainty as to future developments. As in many other trades, the future course of the sheet iron trade will hinge entirely on the settlement of the tariff question. Owing to the monetary stringency contemplated improvements in rolling mills were, in most instances, deferred or abandoned, and the more recent agitation attending the tariff discussion has served to discourage any particular enterprise among rolling mill proprietors.

Black Sheets for Tinning.

The development of the domestic tin plate industry has created a rapidly increasing demand for black sheets for tinning purposes, which has been, perhaps, the most satisfactory feature in the year's sheet iron trade. Rolling mill proprietors have in some instances introduced the mills into their plants, and this movement is apt to grow to large proportions as the American tin plate manufacture increases in importance.

Sheet Brass and Copper.

Brass and copper rolling mills were busy in the first half of the past year, but experienced a falling off in business after July 1, variously estimated at from 6½ to 50 per cent. Competition is not quite so severe in these materials as in most other lines of goods, consequently the margin of profit on sales has not in general been excessively reduced. Some Western manufacturers, nevertheless, complain that it is increasing, and that it appears likely to grow in severity rather than to abate. The proposed tariff will not have much direct effect on the manufacture of sheet copper and brass, but its discussion, by fostering the general business depression, has sensibly affected the trade in restricting sales and discouraging building operations. The use of sheet copper in architectural work grows yearly, and a notable increase in sales of cornice copper is referred to by more than one of our correspondents.

Sheet Metal Machinery.

Manufacturers of sheet metal machinery, tinners' tools, &c., have shared in the general depression which has affected their sales of staple goods unfavorably. In some cases, however, where special tools or appliances are made, concerns are able to report a satisfactory volume of business. This has been the experience of a New York State firm who are large makers of heavy metal working machine tools, and who report as follows:

In some of our lines the volume is considerably greater than in previous years, due to a steadily increasing trade. In some other lines which we sell to consumers more readily affected by the business depression, the sales have been lighter. The margin of profit has been, generally speaking, a trifle less. We have brought out a number of improved designs of our machinery, and feel that every enterprising house should take advantage of the comparatively dull season to bring forth improvements and new products. There is no better time likewise to improve one's own facilities for manufacturing by the addition of new tools, machinery, &c. While in 1892 a large amount of new machinery was purchased for new additions to works, these purchases have continued during the present year from time to time as it appeared to our interest to rearrange and facilitate work in the different departments.

Several other correspondents speak of having made improvements in appliances during the year or of being at work on new labor saving machinery, and this fact speaks for itself as to the health of the trade.

Tinners' Tools.

A prominent concern in New York State, who are among the leading manufacturers of tinners' tools and implements, favor us with the following observations in regard to their business, which adequately picture the condition of the trade in general:

The volume of business compares unfavorably with other years. The month of July and the month of November have been the worst, or next to the worst, of the months respectively in 30 years, surpassing in that respect the worst months which succeeded the panic of 1873. Competition keeps on growing, and it is a kind of competition approximating closely to the kind the tinware business went through about 15 years ago—that is to say, it seems to be the endeavor on the part of some manufacturers in parts of our line to cheapen goods at the expense of quality. The margin of profit has a tendency to diminish along with the constant diminution of the selling price of goods, and the only possible way for the manufacturer, in our opinion, to arrest this tendency, as far as it affects the manufacturer, is to introduce labor saving machinery, which reduces to some extent the cost of manufacture.

Another correspondent in the trade sends us the following remarks embodying his opinion in regard to the supercession of American born labor by that of the foreign element which is now overcrowding the trades:

Among those who do not dabble in politics there is occasionally one who is sincerely anxious for reforms; and while one may feel at times like crying out against the existing state of things, yet he knows that only the echo will come back, as if spoken against the surrounding walls. The particular thing that I have in mind is the law relating to citizenship. We all know something of the ignorant masses who are flocking to our shores; and yet in the face of all this ignorance, to say nothing of the vicious habits of the ordinary immigrant, they soon have a hand in molding the future of our nation and laws through the ballot box. These persons may be able neither to read nor write, yet this blood bought privilege of freedom is handed out to them as a thing of little or no value. And now the question comes so forcibly and vividly: How about our boys, who, perchance, could read and write at the age of seven years? They are good and loyal citizens, and at an early age are made acquainted with the principles of our free system of government. Yet they must be restrained and withheld from the exercise of their preferences against the invasion of their rights by this incoming tide of immigration—kept back until the age of 21? Would it not be a godsend to us as a nation if equality, at least, might be accorded to those of our own household, along with the adventurer from a foreign shore? If these people were held back, at least until they could read and write, would it not in itself prove a stimulant leading upward and out of absolute ignorance? And then one might contemplate the ever growing competition between the different political parties, in the establishment of free schools for instruction in this very essential line of education. Indeed, what a system of free education it might become!

Canada is able to show a foreign trade for 1893 which is the largest in the history of the Dominion—namely, $247,694,000, as compared with $241,369,000 in 1892—the next largest on record.

ROOFING AND CORNICE.

Roofing and Cornice Trade.

WE have been favored with many reports from members of the roofing and cornice trade located in all parts of the United States, and among the several expressions of opinion it is natural to find a wide variety. In fact, from the reports of certain individuals one would think that the year had been one of remarkable prosperity, and that the coming year was full of hope. Single examples from the East and West and South relate to an increase in business of 50 per cent. These, however, are the exceptions, and it must be recorded that the general state of the roofing and cornice industry is much the same as it is with other industries.

State of the Trade.

While we mention the opinions of a few favored concerns, the bulk of reports all speak of a decrease, the average figure being about 30 per cent. as compared with the preceding year. It is notable, however, that up to July 1 the trade in this line was excellent and much ahead of previous years. At that time the financial stringency came and cut down business by rapid strokes. It was it that brought on the depression of the middle of the summer and turned a profitable year into an unprofitable one. The roofing industry depends primarily, of course, on the building trades, and the monetary difficulties interfered with it very much.

A Chicago correspondent, in speaking of the coming year, expresses himself as follows:

We consider the prospect in the building business to be anything but encouraging; and while there is no doubt that building can be done cheaper in 1894 than during any previous year, there seems to be very little figuring in architects' offices. The residence portion of the city shows a surplus over the demand, and we know of but few contemplated improvements in the business portion. During the year past the financial stringency has, in many cases, induced owners to have work repaired where, in ordinary times, an old roof would be thoroughly overhauled or renewed.

In a general way the prospects for the coming year are uncertain, and many of our correspondents frankly admit that it is impossible to tell what 1894 will bring forth.

The Tariff Discussion.

The opinions respecting the effect of the proposed tariff legislation are divided, though very many of our correspondents express the belief that general prosperity will be interfered with by the reduction in duties, and that indirectly, therefore, the building interests will be affected. It is generally conceded that tin plates will be reduced in price, which would be ordinarily to the advantage of the roofers and cornicemen, but that the unsettlement of general business would more than offset this advantage.

Opinions From the Trade.

The majority of favorable reports come from the East, the West being particularly unfortunate in the volume of business compared with previous years. The tenor of the many letters we have received is summed up in this humorously pathetic sentence from the communication of a Cincinnati correspondent. After discussing the general situation, he says:

Please accept these statements merely as a personal opinion which the lapse of time will doubtless change. To sum it all up, we don't feel good.

Another Ohio correspondent, referring to the effect of the financial stringency on the business of the year, writes:

This is where all the mischief has been accomplished. Owing to the masterly inactivity of the present Congress our industries have been idle during the past season. We are in one of the iron centers, and owing to tariff tinkering all such manufactures are simply paralyzed, which, of course, has a serious influence in this section of the country.

A correspondent in Kentucky, treating of the general situation, sends us the following wise comment:

The political press has so disarranged the otherwise good judgment of our good American people as to render them too susceptible to all sorts of fits on short notice. The very fact that we have been liberal in contracting obligations during the past 20 years, and our ability as a nation to meet them now having been changed by ourselves, should, in our opinion, induce us to shut or put up with less music. If the large number of public educators (newspaper editors) were made to swallow articles paid for, and if we had business men at Washington to do our business in place of lawyers, we have an idea that matters would go on finely.

Magnitude of the Industry.

An Eastern correspondent sends us the following bearing on the industrial situation and the importance of the roofing and cornice industry:

That the manufacture of metal building material is growing is proved by the extensive plants that have sprung into existence the last few years, and the constantly increased capacity of rolling mills. Mills which a few years ago did not consider this branch of the business worth looking after are now deriving their entire income from it, and are running night and day to supply the demand for sheets for building purposes. We are one of the pioneer firms in this line of business, and can say that its growth was something remarkable, both in capital invested and output. Twenty-five years ago there were but three firms in this business, with about $10,000 invested, and now there are hundreds with millions of dollars invested, and the number of men employed, directly and indirectly, runs into the thousands. It is only quite recently that men of capital realized that this industry is an important one and still growing, and the prospects are that the next few years will see it taking greater strides than ever.

A Southern Report.

Turning to the situation in the extreme South, it is pleasant to read such a favorable report from Florida, though it is possible that the writer may, through local pride, take a rather too sanguine view of the situation.

We have passed through a severe year, but very few failures are the result. Though our people, as a rule, are not burdened with an overplus of money, debts are being paid, and we are economizing as a class, while the laborers, as a rule, are all employed. There are many mechanics from the North and West coming here for the winter, and in many cases they are not successful in getting employment, as our people at large fully believe that any work to be done should be awarded to those who are with us all the year. The general feeling throughout the State is one of buoyancy, and we look toward the coming year with bright anticipations, with the feeling that the worst of the storm is over. Money is easier and is flowing into the channels of trade. Many of the towns are waking up to the fact that if they do not fall in with the march of progress they will be relegated to the background, and as a consequence many public improvements are contemplated.

Machinery Makers.

Those concerns who are engaged in the manufacture of machinery for the use of the roofing and cornice trades send in variable reports concerning the business during the past year. Some have recorded an increase and others a decrease, and their opinions similarly are divided in respect to the prospect for 1894. All of them naturally have suffered from the stringency due to the silver trouble during the summer, and the tariff agitation has likewise had its unsettling effect, but the actual result that would follow the enactment of the Wilson bill is variously interpreted. Most of the writers, however, believe that it would injure business and would

therefore indirectly harm the trade in machinery.

In a thoughtful letter we have received from a prominent manufacturer of roofing machinery are the following remarks on the disastrous effect due to the agitation of tariff matters:

While I am aware of the tendency to attribute the stringency in money and lack of business to whatever may appear on the surface, it does seem on mature reflection that the periodical agitation and the carrying out of extreme measures relating to the tariff lead directly to a lack of confidence, and a consequent adverse condition of things. On the strength of high tariff there are based certain plans upon which may depend everything to the founders of such enterprises, and extreme measures either way in relation to this question may cause uncertainty. An example is the case of tin plates, the price of which was so increased by the enactment of the McKinley bill that there was a sudden falling off in the use of terne plate for roofing purposes, and all enterprises, upon which this would have a bearing suffered therefrom. And now a radical change is to be made in the opposite direction, the result of which may be conjectured. The question naturally asserts itself, Are such radical and extreme measures likely to result in the best good to all concerned?

National Iron Roofing Association.

The regular annual meeting of the National Iron Roofing Association will be held in St. Louis January 11 and 12. Quarters have been secured at the Southern Hotel, where all delegates will report. The principal business of the meeting will be the adoption of the new gauge established by Congress in March, 1893, and the weights, price-lists and discounts as based upon that gauge. The St. Louis committee, consisting of the American Roofing Company, St. Louis Corrugating Company, and E. E. Souther & Bro., have made the necessary arrangements for the entertainment of the delegates. A banquet will be tendered the delegates at the Mercantile Club, on Thursday evening, the 11th inst., and unless the weather interferes a carriage drive will be given the delegates on Friday the 12th. A full attendance is anticipated, and, as there are many matters of interest to be brought before the meeting, it is to be hoped that none will neglect to be there. We print below a full list of the houses comprising the association:

Ætna-Standard Iron & Steel Company, Bridgeport, Ohio.
American Roofing Company, St. Louis and Cincinnati.
Beager Mfg. Company, Canton, Ohio.
Cambridge Roofing Company, Cambridge, Ohio.
M. H. Crittenden & Son, Minneapolis, Minn.
Canton Steel Roofing Company, Canton, Ohio.
Cincinnati Corrugating Company, Piqua, Ohio.
Chas. H. Conner, Louisville, Ky.
J. H. Eller & Co., Canton, Ohio.
Garry Iron & Steel Roofing Company, Cleveland, Ohio.
Globe Iron Roofing & Corrugating Company, Cincinnati, Ohio.
W. G. Hyndman & Co., Cincinnati, Ohio.
Kanneberg Roofing Company, Canton, Ohio.
W. A. List & Co., Wheeling, W. Va.
James A. Miller & Bro., Chicago, Ill.
Porter Iron Roofing & Corrugating Company, Cincinnati, Ohio.
E. E. Souther & Bro., St. Louis, Mo.
St. Louis Corrugating Company, St. Louis, Mo.
Wheeling Corrugating Company, Wheeling, W. Va.

FLASHINGS.

A. Northrop & Co., Pittsburgh, Pa., issue an attractive illustrated catalogue relating to their patent paneled sheet metal ceilings and walls. The volume begins with illustrations showing simple ceiling panels, then sectional cuts showing the method of application, also outline drawings of cornices and moldings. Then come more elaborate designs of pauels, followed by examples of ceilings that have been put in place in various buildings. A centerpiece shows the interior of an opera house at St. Johnsbury, Vt., 65 x 100 feet in size, entirely finished by Messrs. Northrop & Co. The remainder of the catalogue contains various examples of ceilings, all being half-tone engravings that show very accurately the appearance of the sheet metal work. At the close of the pamphlet are several pages of references from all parts of the United States.

In spite of the severe business depression existing last year, the business of the Central Expanded Metal Company, Pittsburgh, Pa., manufacturers of expanded metal lathing and fencing, was considerably larger during 1893 than for the preceding year. In Eastern cities the demand for expanded metal lathing has been particularly heavy and bids fair to be larger this year than last. In the West the demand is also showing gains, and the outlook in general for the year upon which we have just entered is exceedingly promising.

E. A. Balm assumes the management of the Illinois Roofing & Supply Company, 203 Lake street, Chicago.

The American Roofing Company, St. Louis, Mo., and Cincinnati, Ohio, report a prosperous year in both of their factories, notwithstanding the troublous times experienced during the past 12 months. The silver producing States were perhaps more affected than any other portion of the country, and as the American Roofing Company ship largely into these States it looked rather uncertain at one time whether their business would equal that of 1892. They are glad to announce, however, that their expectations have been more than realized, and they open up the new year confident that it holds good things in store for them. They have recently contracted for new machinery for both of their plants, which will shortly be placed in position.

The American Radiator Company, 111 Lake street, Chicago, have recently received orders for radiators for the Stock Exchange and Champlain Buildings, Chicago; St. Nicholas Building, St. Louis, and numerous others equally important.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

H. W. Cutler, Tyrone, Pa., plumber, has been awarded the contract for furnishing and placing the Ludlow Valve Company hydrants in the new district, the Sixth and Seventh Wards.

The contract for the steam heating plant in the new town house at Antrim, N. H., has been awarded to Randall & Co. of Concord, N. H., and it is said an even $1000 will be paid for the job.

Hart & Crouse, 211 Water street, New York City, report the following recent sales of Royal steam and hot water heaters in residences only: A. L. Bailey, St. Johnsbury, Vt.; Mrs. C. K. Hetzel, Bay Side, L. I.; J. S. Perine, 128 Vroom street, Jersey City, N. J; Geo. W. Rockerfellow, Plainfield, N. J.; Geo. E. Berna, 632 West 145th street, New York City; Dr. C. A. Wilson, Dubois, Pa.; Mrs. Emma Darling, Plainfield, N. J.; W. Potter, Mount Pleasant, N. J.; S. S. Whittelsey, Plattsburg, N. Y.; A. M. Brown, Keyport, N. J.

The March-Brownback Stove Company of Pottstown, Pa., have just installed a hot water heating plant in the residence of Rev. D. K. Humbert, Bowers, Va. Their No. 20 Crown hot water boiler is used in this plant and it is serving satisfactorily; 705 square feet of radiating surface besides supply and return pipes. This is claimed to be powerful work for a small sized boiler.

The School Board of La Salle, Ont., awarded the contract for supplying a boiler to W. Powers for $300, and the contract for installing the heating plant to A. Landry for $1533.

Sealed proposals will be received by the Board of New City Hall Commissioners, at San Francisco, Cal., up to January 27 for two new 75 horse-power boilers to be set complete. Bids must include the removing of four old boilers. Bids must be made upon blanks that will be furnished by Secretary J. J. McCarthy.

Spearing & Co., Guilford, Maine, are engaged in installing a steam heating plant in the new school house at Milo.

M. A. G. Miller, Lancaster, Ohio, recently received the contract for putting in steam heating fittings and plumbing fixtures in the court house, jail and sheriff's residence, at McArthur, Ohio.

A. A. Sanborn bid $1934 and secured the contract for the heating plant for a new school house to be built at Somerville, Mass.

Among the contracts for steam heating recently taken by the Illinois Heating Company, 88 Lake street, Chicago, can be mentioned the following: Residence of J. C. Jones, Grand boulevard and Forty-second street; apartment building of R. A. Grifenhagen, residence of B. F. Sweet, Western Springs Ill.; residence of F. Swannell, Kankakee, Ill.; two residences of Hecox estate, Austin, Ill.

The work of putting in a heating apparatus at St. Mary's Home, at New Bedford, Mass., is being done by Daniel W. Wilson, who has the contract to heat the structure with hot water.

STEAM AND HOT WATER.

Steam and Hot Water Heating Trade.

CONSIDERING the fact that house heating by steam and hot water is, we may say, a modern system, and more expensive than the older forms of heating by furnaces and stoves, it might be expected that in times of financial difficulty such as the past year the business would suffer very materially. Such, however, does not seem to be the case, or rather, while there has been a great deal of complaint in the steam and hot water heating trade, it is not notably more than in other lines of business. In fact some of our correspondents, inform us of an increased trade. The most complaint is heard from the West, the general feeling there being not over sanguine. In the Eastern States the condition as reported is more satisfactory. Profits, as might have been expected, are lower than they have been.

New Forms of Boilers.

It is noticeable that the patterns of boilers for steam and hot water heating are undergoing less radical changes than in the past. A few years ago, when the system was just coming into popularity, every inventor had some particular notion concerning the design of heating boilers, which was to supersede all former constructions. This search after new forms, regardless too often of efficiency, has largely ceased, and the makers are content to improve along certain well-established lines. This is a decided benefit, for only by carefully watching apparatus, and little by little remedying the defects, can the best results be reached. Occasionally some radical departure may be taken, but there was in the past altogether too much guess work in the designing of odd and peculiar forms. The trade is constantly improving in the matter of installation, and the public are better served with steam and hot water than they formerly were.

The Financial Stringency.

A very important factor in the past year's trade was the financial stringency, and this influenced the boiler business as it did all other lines. In some cases it actually cut down sales and entailed loss through bad debts, and in others it merely prevented an increase that was looked for. A very prominent heating engineer, who does work over a large area of country, in referring to the effect upon business of the financial trouble, says:

This is a most difficult question to answer. While I have done a good business, there was a prospect of 25 per cent. increase if the whole of projected buildings had been put under contract.

A correspondent in Minnesota speaks so cheerfully of the past year that we deem it expedient to quote a line or two from his letter, if for nothing more than for the moral effect of a few encouraging words:

Business in general has been very good this year. There have been no failures of any kind. Banks all passed through the panic so far all right.

Another firm from the Middle States write:

The prospects in April last were for a better year than any previous year, but owing to the financial stringency many of the contemplated large buildings were abandoned.

The smaller concerns throughout the country were not so immediately affected as those in the larger cities and doing an extensive trade. The complaint, however, comes from them that they are feeling the influence of the stringency long after the real trouble has passed. A firm of contractors commenting upon the influence of the money difficulty say:

A great deal of projected work has been dropped; some in progress stopped owing to it. The World's Fair, however, had its share in this way, that people who had to have repairs or changes made in their heating apparatus, used the money for the fair and let the repairs or changes go until another year.

The Effect of Tariff Agitation.

The steam and hot water heating manufacturers are naturally interested in the prospects of the tariff, though their interests are not so immediately affected as those of many other manufacturers. The influence upon their trade, whatever it may be, will be of an indirect nature, and will result from the effects of a changed tariff on the general business of the country. Whatever may be the opinion of our correspondents concerning the effect upon business of higher or lower duties, they are practically unanimous in condemning the tariff agitation. Their criticisms upon the evils of tariff discussion vary from a temperate statement that the effects are bad to the most violent tirades against the legislators who are responsible for the tinkering. One correspondent, eminent in the trade, writing on the matter, says:

Almost anything is better than uncertainty. Indeed, it is not impossible that a bad tariff persevered in for a long term of years would be less disastrous in its effect than the best tariff that can be devised with the quadrennial doubt hanging over the country as to what each Presidential election will bring forth, with possible changes each time in protective rates. . . . We believe that any system of tariff legislation that would insure a fixture of satisfactory customs rates for a longer term—say not less than ten years—would have the support of the whole community. As to the effect at the present time of procrastination in Washington upon our industries, we emphatically declare that not until a tariff bill of some sort is passed and signed can the country hope for any improvement either in commerce or manufacture. The immediate outlook is from bad to worse; the longer the period of uncertainty the more cumulative the depressing effect upon business, and especially upon our so-called laboring classes.

A Pennsylvania manufacturer of heating apparatus writes:

Owing to the very unsettled condition of things at this time it is very hard to make any calculations for the future so far as business is concerned. We had a prosperous, increasing business all along until our representatives at Washington began at the tariff. Then it seemed the bottom dropped out at once. We were busy all during the time of the extra session; the silver bill did not affect us and we passed safely over its repeal. But after the tariff matter came up we began to lose business and have been losing ever since. But we hope that things may make a turn for the better soon.

The Future.

It is needless to speculate as to the future in this line of trade. It depends essentially upon the condition of the building interests. If business at large revives and enterprise becomes stimulated, buildings will be erected needing heating apparatus, old heaters will be replaced with new ones and the trade will flourish.

Master Fitters' Association.

It will not do to pass over this department of business without a reference to the Master Steam and Hot Water Fitters' Association of the United States that is doing efficient work in bringing the heating engineers together at their annual convention, smoothing out business difficulties and in various ways furthering and advancing the trade.

HEATING NOTES.

AT THE BEGINNING of the year several consolidation schemes were talked about in the steam and hot water trade and some were effected. This made quite a difference in the competition among individual firms, and has altered the business not a little. Whether these consolidations are to prove per-

manent, as was expected when they were formed, is conjectural, and, in fact, hints are heard that harmony is giving away to discord.

PREPARATION is being made by W. M. Mackay, manager of the heating department of Hart & Crouse, Utica, N. Y., for a better display of the Royal steam, hot water and hot air goods at his new sample rooms and storehouse, at 211 Water street, New York.

W. H. OAKES of Boston left the compliments of the season in person at the office of the American Boiler Company, New York.

GEO. E. DOWNE of Chicago has been spending a few days with the American Boiler Company, at 94 Centre street, New York.

THE IDEAL HEATING COMPANY have been incorporated in Oskaloosa, Iowa, with $100,000 capital, to manufacture Phelps' Ideal heaters. The new firm, of which Chas. Phelps will be president, will absorb the Sanitary Plumbing Company of that city. Mr. Phelps was formerly secretary of the Sanitary Plumbing Company.

KEGGIE BROTHERS of Joliet, Ill., are preparing to push the sale of the Treat house heating boiler. They have purchased the property adjoining their present plant, 150 x 68 feet, on which they intend to erect an extension.

Miscellaneous.

Among the constituency of *The Metal Worker* are counted the representatives of several industries which, although not coming actually under the heading of any one of the leading trades to the interests of which this journal is committed, yet are so far in touch with those trades as to make a brief account of their condition both acceptable and useful to our readers. All these industries, without exception, have shared in the ill effects of the country's general business depression, in a greater or less degree, and the tale of sharper competition and diminished margin of profit is common to nearly every one of them.

Foundries and Machine Works.

Jobbing foundries and machine works in New England, Pennsylvania and in some Western and Southern States have been heard from. All the reports indicate a material falling off in the volume of business for the year. The decline is variously estimated at from 25 to 50 per cent., usually confined to the last six months of the year. Competition is generally referred to as being more formidable and profits much narrower, while prospects show no sign of present improvement.

Foundry Facings and Supplies.

A large manufacturer of foundry facings and supplies in a Western city writes as follows:

The business of the first half of the year was probably 33⅓ per cent. over last year, but the latter half fell off as much as or more than the gain of the first six months. Competition is more active, and the margin of profit considerably less—1, on account of the smaller demand for goods; 2, to increased competition, and 3, because a lower class of goods is being introduced than was the case formerly. More or less of our customers who manufacture goods which are highly protected are in a quandary how to act; therefore their plants are not in operation and we suffer as much as they do.

Portable Forges.

An Eastern maker of portable forges mentions having found his volume of business 20 per cent. less than that of 1892, although competition was no stronger and prices lower.

Wheelbarrows, Trucks, &c.

Some prominent Western makers of wheelbarrows, trucks, road scrapers, &c., have fared better than most of their neighbors, as their sales have declined only 10 per cent., a comparatively good showing in such hard times. They report that competition is stationary, and that profits remain on the same level as in previous years. They have been actively engaged in perfecting improvements in their goods. "We have run our shops," say they, "with our full regular force during the entire year, but since September 1 eight hours per day instead of 10. We have not lowered wages, and do not intend doing so."

Brass Goods.

Generally speaking the business in brass goods declined considerably in the latter months of 1893, in some cases as much as 50 per cent., although a prominent New England manufacturing firm report an increase of 10 per cent. in sales over 1892. Competition has not apparently increased to any remarkable extent, but this may be attributed to the fact that a number of producers were shut down altogether during the dull period. Prices, however, were extremely low, and profits correspondingly small in consequence. A growing demand for first class goods is noted.

Wire Goods.

Manufacturers of wire cloth, fencing, netting and other wire goods in both the Eastern and Western States write of a loss of business in the last half of the year, although previous to that their sales were well up to or in excess of normal. A Pennsylvania firm reports as follows: "Since August 1 jobbers order very cautiously and only for their immediate wants. Their orders are usually small, only about half what they had been before, and many of them seem to have no call for the goods—have not ordered since the spring. The falling off on August 1 was marked and well defined. Trade up to that date had been excellent, even July was better than usual for July." There seems to be little new competition in the trade, but those already in the field were more active in seeking business, the result being lower prices and a smaller margin of profit.

Paints and Cement.

The paint and cement trades felt the stringency in full measure. A leading Eastern concern, who are accustomed to calculate a large increase of business every year, confess to a falling off to the extent of 20 per cent. Competition is not appreciably greater, nor is the margin of profit much less on these materials. Complaint is, however, made of slow payments and bad debts, one firm stating that the latter item, which does not usually exceed ½ per cent., amounted this year to 4 per cent., owing to the failures of customers, while their best paying customers took unlimited time to settle their accounts. A Southern cement concern gave quite a gloomy report of their year's business, which they say has been 75 per cent. below the average, while the margin of profits has been reduced 50 per cent.

Lanterns.

A manufacturer of lanterns in the East estimates that his business has been adversely affected by the financial stringency to the exteut of from 30 to 40 per cent., while the outlook is far from promising.

Reflectors.

A correspondent who is a maker of reflectors for lighting public buildings, churches, &c., is happily able to report the unusual experience of 20 per cent. increase in the volume of his business. This was offset to some extent, nevertheless, by a declining margin of profit. The prevailing dullness in the building trade does not present itself to him as holding promise for a good business this year.

Aluminum.

The many uses to which aluminum can be adapted have caused such a rapidly increasing demand for the metal as to keep up quite a brisk trade while most industries have been under the weather. One of the leading reduction companies in the Middle States informs us that the volume of business transacted by them has been 150 per cent. greater than that of 1892, and that it has grown in this proportion every year since 1888. Had the financial stringency not intervened, however, the proportion would have been much larger last year. The selling price of aluminum has been materially reduced during the year, consequently the margin of profit on individual sales has proved much smaller. Competition is not excessive, the industry being, so far, confined to comparatively few manufacturers.

Mica.

Manufacturers of mica goods and dealers in the mineral speak of increased business in 1893, but with rather less profit in it. Competition does not grow stronger, nor is the anticipated tariff bill likely to affect the industry.

Gas Meters.

An Eastern concern manufacturing gas meters have felt the recent general stringency in money affairs to the extent of a shrinkage of 30 per cent. in their year's sales. They have seized on the dull times to make a number of im-

provements in their tools and methods in the direction of economy and quickness of handling. The outlook they believe to be good, as business is thought to have reached its lowest point already. The Wilson tariff bill would affect this business so far favorably as to give them cheaper tin plate, but its indirect effects would be more intimately and unfavorably felt through those produced on their customers.

Thermometers, &c.

Thermometer and instrument makers report less business since July than for a long time previous, with sharper competition among the members of the trade. Some notable advances have been accomplished during the year in the direction of efficiency and cheapness—particularly in the line of thermometers for mechanical purposes.

New York Trade School.

THE thirteenth season of the New York Trade School, at Sixty-seventh street and First avenue, New York, was opened by an assembly of the scholars for the new day classes of the different trades in the lecture room at 3 30 o'clock last Thursday afternoon. The room was filled with a larger number of young men than has ever entered the school in the past, which is substantial evidence of the appreciation of the excellent institution founded by the late Col. Richard T. Auchmuty.

The opening address was made by Harry Brill, clerk of the school, who explained that the institution represented the most cherished ambition of its founder, and that by his death during the past year not only the institution but the young men of the country had lost an inestimable friend. In the past he had enjoyed extending a cordial welcome to the young men who had come there in search of knowledge that would make the world better for their having lived. The school had been so established and perfected by the founder that it must continually increase in usefulness. Mr. Brill then introduced R. Fulton Cutting, chairman of the Board of Trustees.

Address of Mr. Cutting.

Mr. Cutting, among other things, said: "I am glad to meet so many pushing young men, as I appreciate that there are both motive and determination back of the decision to become educated and skilled workmen, and you can rest assured that the most intelligent and skillful workmen are always in demand. Every effort will be made to advance you beyond many of the workmen of to-day in the practical science of the trade you have selected. One of the things not taught as a part of any of the trades or belonging to any particular trade, yet essentially necessary to success in all, to which I wish to call attention, is honesty, absolute, strict honesty that would prevent the substitution of cheaper materials to increase profit or any similar subterfuge. I hope every scholar will appreciate this quality and cultivate it until he establishes a reputation which he will find is invaluable.

"Another characteristic that you will find indispensable to success, no matter in which trade you work, is industry. The man who is always busy, earnestly, honestly and intelligently working, is on the road to success and sure to prove a valuable citizen. Young men, you are in a large city and all of you may have a curiosity to see 'the elephant.' You will find plenty to act as showmen, but the sight will be more expensive than beneficial. I warn you against it, not that any special restrictions will be placed upon you, for your own sense of right will govern your behavior. To any who may get into trouble of any kind, come to your friends first, for while I hope that none of you will have any misfortune I shall be ever ready to extend a helping hand or give such information and advice as may be desired, for I do not want any of you to suffer when a few words with me will prevent it."

The Method of Teaching.

was then explained by Mr. Brill, who spoke, in substance, as follows: "Capable instructors will give you manual training, and by frequent lectures, scientific information on the different trades will be given. Close attention will be necessary, as frequent examinations will be made to learn of your progress. At the end of the term you will be subjected to an examination, which, it has been said, would be difficult for many workmen to pass; but by diligent work and careful attention at the lectures, any pupil will be readily able to pass it. A record book is kept of your attendance and progress, so that the welfare of no pupil is lost sight of, and a good record is desirable at the end of the term. The school has a repository for money, so that the risk of carrying a sum of money can be avoided and such amounts as may be needed can be drawn as required. This has been found a great convenience to scholars in the past. I caution you to take care of your health in the changeable climate of this city; and should you need medical treatment, or be taken ill, arrangement has been made with near at hand hospitals for your benefit."

Address of Mr. Thomas.

J. Stanly Thomas was next introduced, and in his address he said: "I am impressed that we are all strangers in a great city, but a cordial welcome awaits you all at the dormitory, where a brotherly feeling will increase the pleasure of all. I shall endeavor to get near to the hearts of all of you in our dormitory life and to win your confidence, so that the place will seem like a home to you. I shall be devoted to your interests, and will be ever ready to hear how I can do you a favor. I recount to you the kindness and earnest interest the instructors have extended to their apprentices in the past and recommend that you place perfect confidence in them, and I feel sure that all will be pleased with the result. I again counsel you to forbearance and courtesy in your behavior and industry in your work, that the time you spend here may pass quickly, happily and beneficially."

Mr. Brill then dismissed the boys, who were personally greeted by both Mr. Cutting and Mr. Thomas.

The numbers in all the classes are at top figures this year, the day class in carpentry having 25, in bricklaying 17, in painting 11, in sign painting 11, and in plumbing 143 apprentices. The plumbing class, which might have numbered 200, far exceeds all previous classes and overwhelmed the provision made for it, so that, though several new benches have been erected, many applications have had to be rejected.

The members of the class this year come from all parts of the country, as is shown by the following list:

DAY PLUMBING CLASS 1894.

Thos. J. Adams, Yorktown Heights, N. Y.
Richard J. Angell, Oxford, Mass.
Louis Arndtstein, New York City.
Christopher Atkinson, Columbia, S C.
Luther M. Barnes, Collinsville, Conn.
Vincent M. Barnes, Great Neck, L. I.
Thomas E. Barry, Boulder, Col.
Edward Battle, St. Thomas, Ontario, Canada.
William F. Baum, Bethlehem, Pa.
Bertie C. Beach, Greene, N. Y.
Albert R. Becker, New Orleans, La.
Adam Berle, New York City.
Louis P. Bitz, Portchester, N. Y.
Walter H. Blair, Westfield, Mass.
W. Asahel Blakeslee, Westfield, Mass.
Herman T. Bohlman, Brooklyn, N. Y.
Eugene F. Bouque, Moberly, Mo.
Fred'k F. Bowron, L. I. City, N. Y.
Jas. H. Boyd, Chicago, Ill.
Francis P. Brady, Johnstown, Pa.
J. T. Brady, New York, N. Y.
Walter B. Bratton, Lewistown, Pa.
Geo. S. Bray, Hazelton, Pa.
John M. Briggs, Meridian, Miss.
Nimrod Bryant, Edwardsdale, Pa.
Emmer Buck, Knoxville, Pa.
James F. Clarke, Lewistown, Pa.
Charles E. Cragie, Lancaster, N. H.
Henry W. Crane, Elizabeth, N. J.
Allen E. Custer, Bridgeton, N. J.
Geo. Dannenfelser, Westchester, N.Y.
Albert M. Darling, Jr., Riverhead, N. Y.
Ira De Baun, Hackensack, N. J.
Wm. J. Dent, Skaneateles, N. Y.
Frank Desmarias, Pont du Sault, P. Q., Canada.
Elmer B. Doolittle, New Rochelle, N. Y.
Chas. O. Dougherty, Altoona, Pa.
John E. Dugan, Albany, N. Y.
John W. Duncan, Lowell, Mass.
Wm. A. Dunn, Newark, N. J.
John M. Edgar, Hyde Park, N. Y.
William Edgar, Hyde Park, N. Y.
John J. Engel, Elizabeth, N. J.
John N. Enright, West Point, N. Y.
Herbert Fay, Plantsville, Conn.
Geo. G. Fender, New York, N. Y.
John Finigan, Paterson, N. J.
Harry Fisher, Pottsville, Pa.
Harvey N. Foster, Waterbury, Vt.
Luther E. Foster, Claremont, N. H.
Wm. G. Foster, Pittston, Pa.
Wm. Foulois, Washington Depot, Conn.
Peter J. Garvin, New York, N. Y.
John J. Gilligan, Wilkes Barre, Pa.
Maurice Gould, Campbell, N. Y.
Cornell Grav, Onadaga Hill, N. Y.
Milton O. Hager, Johnstown, Pa.
Alvin W. Hand, New York, N. Y.
John A. Harris, Plymouth, Mass.
Albert Hart, Jr., Pearsall, L. I.
Thos. W. Hawkins, Tottenville, N. Y.
Ralph W. Hawthorne, Elgin, Ill.
Frank E. Hayden, Cassopolis, Mich.
Chas. H. Higby, Port Jervis, N. Y.
John Hoeman, Chicago, Ill.
Elwood Hutton, Portsmouth, N. H.
Richard Ingalls, Lowell, Mass.
Geo. C. Jenks, Goffstown, N. H.
Ossian Johnson, New York, N. Y.
Wm. J. Juergens, Wheeling, W. Va.
Chas. Kallman, New York, N. Y.
Martin Kenley, East Winsted, Conn.
James J. Kenny, New York, N. Y.
Albert F. Kenny, Salem, Mass.
Theo. A. Klenke, New York City.
Chas. L. Kuhls, College Point, L. I.
Edward W. Long, Louisville, Ky.
Benj. Lowenthal, Rochester, N. Y.

Thomas F. Lowndes, Jr., New York, N. Y.
Ellison A. Lowndes, New York City.
Matthew Mackey, Olyphant, Pa.
Geo. B. McCollum, Oil City, Pa.
Peter McCormick, New York City.
John McNanamy, Lancaster, Ohio.
Patrick J. Moriarty, S. Hadley Falls, Mass.
Reginald Morton, Chiltonville, Mass.
Guido Muller, Brooklyn.
John H Mulligan, Vicksburg, Miss.
Thomas Nisbit, Elizabeth, N. J.
Charles J. O'Hanlon, Savannah, Ga.
Tracy O'Hara, Paterson, N. J.
Fredk. W. Otte, Peekskill, N. Y.
James H. Peck, Port Jervis, N. Y.
Wm. Peterson, Paterson, N. J.
Geo. A. Pinchbeck, New York, N. Y.
Wm. J. Pulte, Grand Rapids, Mich.
Thomas J Quicke, West Point, N. Y.
James P. Rand, Lakeport, N. H.
Frederick Reagan, St. Stephen, N. B., Canada.
Frank L. Recker, Altoona, Pa.
Chas. H. Redfield, Sag Harbor, L. I.
Robert M. Rees, Pocahontas, Va.
J. W. Reese, Cazenovia, N. Y.
Geo. M. Rhoads, Reynoldsville, Pa
Eugene Royce, Avon, N. Y.
Pearl B. Rutledge, Bellefontaine, Ohio.
Wm. A. Ryan, Hamilton, N. Y.
Edwin M. Sargent, Haverhill, Mass.
Theo. Schumacher, Jr., New York City.
George W. Seelig, New York City.
Joseph R. Semler, Newburg, N. Y.
Thomas H. Solomon, Jermyn, Pa.
George H. Soult, Lewistown, Pa.
Fred. R. Spates, Eastport, Maine.
John G. Stack, New York, N. Y.
Henry M. Streeter, Glen Cove, L. I.
Wm. E. Sullivan, Ridgefield, Conn.
Geo. I. Sullivan, New York, N. Y.
Fred'k M. Swartwout, Congers City, N. Y.
Wm. Thompson, New York City.
Edward Train, Passaic, N. J.
Frank H. Trexler, Williamsport, Pa.
Thos. L. Tryon, Elizabeth, N. J.
Oliver M. Tucker, Newark, Ohio.
Peter J. Tyrrell, Naugatuck, Conn.
J. Frank Updegrave, Johnstown, Pa.
Chas. E. Veigard, Scranton, Pa.
Wm. H. Vincent, East Hampton, N. Y.
Fredk. W. Volckening, Brooklyn, N. Y.
Max Volkenburgh, New York, N. Y.
John M. Von Beck, Carbondale, Pa.
George Von Lunen, Johnstown, Pa.
Ernest Walter, Toledo, Ohio.
John F. Weed, Hunt's Point, New York, N. Y.
Harrison C. Wharen, White Haven, Pa.
Alfred J. White, Los Angeles, Cal.
Wm. H. Williams, Larksville, Pa.
Roy O. Wood, Bedford, Ohio.
Joseph W. Woodruff, Elizabeth, N. J.
Wm. C. Wrensch, Montclair, N. J.
Ezra K. Yeager, Natalie, Pa.
Geo. Zinn, Hackensack, N. J.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until January 25 for work, including the plumbing of the United States Post Office Building, at Cedar Rapids, Iowa. Plans may be obtained from the superintendent at Cedar Rapids, Iowa, or at the office of the Supervising Architect, Washington.

The opening of California's Midwinter Fair, at San Francisco, on New Year's Day was attended by most favorable weather and a large and enthusiastic crowd.

Review of the Tin Plate Trade

THE extraordinary depression which pervaded the business of the country generally during the latter half of 1893 was keenly felt by the tin plate trade. Reports with which we have been favored by members of the trade in all sections of the United States, whether manufacturers, importers or jobbers, indicate a marked falling off in the volume of sales, dating generally from about July 1. During the earlier months of the year the trade was, on the whole, eminently satisfactory, and fully up to, if not beyond, the average. The influence of the bugbear of "financial stringency" in the dark days of July and August, however, worked a great change. Collections of outstanding accounts became difficult, and merchants became more guarded in making credits. Money was scarce with consumers, and as dealers largely were cautious about making sales, except to old customers, on other than a cash basis, the trade resolved itself into a hand to mouth business, which has been its distinguishing feature ever since.

Reduced Consumption of Plates.

The large consumers ceased to forestate their requirements and restricted their purchases to such quantities as they absolutely needed for current work. The closing down of several large factories using tin plates and the reduction of operations by nearly all the rest shut off a large portion of the consumptive demand. The canners of the country, who are the largest consumers of coke plates, being in many cases unable to obtain the necessary advances from bankers, were forced to cancel orders, and those of them who had not already laid in their stock of material suspended their usual operations. Similar causes influenced the smaller consumers, consequently the trade was reduced, after July, to the narrowest proportions. The falling off was, perhaps, most marked in the Eastern and Middle States, where it is variously estimated at from 10 to 40 per cent. We present herewith extracts from the reports of some of our correspondents in that section, which gives a good idea of the course of trade during the year. A prominent New York importing firm write at the close of the year as follows:

There has been considerable falling off in the volume of business, especially within the last few months. Competition has very materially increased, as, trade being dull, there has been more disposition to cut prices and push sales, consequently the margin of profit has been much less. The outlook is very discouraging. Owing to the uncertainty about the tariff there will be but little new building, and all trades that consume our goods will be stopped or greatly retarded till the matter is settled.

A Boston firm of jobbers place the decrease in business at about 25 per cent. as compared with that of 1892. In regard to the outlook for 1894, they say: "We look for a year similar in results to the past—possibly a little better." Speculative buying, or buying for future consumption, they have seen none, they add, since the financial stringency.

A house in the trade, doing business in a city of the United States, who are manufacturers as well as importers, express their belief that the trade will adapt itself to whatever reductions the Wilson bill may make. Tin plates, they think, will not be any lower, for, in case of a reduction of duty, English prices will advance.

Manufacturers' Views.

A tin plate manufacturing firm in Pennsylvania remark as follows in regard to the effect of the financial stringency on their business:

The financial stringency, by reason of impairment of credit, abandonment of projected buildings and failures to pay, has been the main cause of shrinkage in sales; 50 per cent. would be about the lowest estimate. The railroads being heavy consumers of our goods used practically nothing, and kindred concerns ditto.

The same firm mention that an increasing demand for a poorer quality of plate has been one of the results of the hard times. Furthermore they remark:

There is a tendency to make a cheap, unreliable article in order to undersell, which has a great deal to do with the adverse reports you see about American plate. We also think that it is a big mistake to use the tariff as a party issue. Constant agitation of the subject is bad for business, and there ought to be a commission to frame a bill and let it go at that for ten years, merely correcting any irregularities.

Another of the largest manufacturing firms in the East report a falling off in sales of 40 per cent., with much keener competition and a constantly decreasing margin of profit.

A third manufacturer, whose works are located in the vicinity of Pittsburgh, speaks of a reduction of business by one-third, due to the tariff agitation. The effect, he believes, of the reduction of duty contemplated by the Wilson bill will be visited on labor in tin plate works, where wages will have to be reduced to meet the increased competition of foreign plates.

Another manufacturer in the same district believes that the introduction of the lower tariff would result in a loss of business and money, especially to those who have invested heavily in tin-plate plants. Matters, he believes, would finally adjust themselves, but in the meantime, "the American trade would suffer, while foreigners would benefit.

The Western Trade.

Tin plate merchants and manufacturers in the Western States have, possibly, escaped the storm better than their Eastern brethren. Yet they, too, complain of a smaller volume of business of 10 to 25 per cent. as well as diminished profits and cutting of prices in some quarters. This feature does not appear to be so emphatic in the Western as it has been in the Eastern market. The tin plate works located in the Western States have, on the whole, come well out of the year. Many of them, though reducing their output, have kept their plants in operation almost continuously and have found a ready market for all their product. The use of domestic tin and terne plates appears to be growing in a more marked degree in the Western States than in any other part of the country. We learn from several correspondents that consumers are largely adopting the use of the native article exclusively on account of its intrinsic excellence. One jobbing firm, with a large Western connection, write to us in the following terms:

This year has been remarkable with us chiefly in showing a steady and constant growth in favor of American tin plates. The result is that to day we are selling over three times as many American plates as we do of foreign, and if it were not for the impending change in the tariff we think the time would not be far distant when our only sales of the foreign goods would be in odd sizes not yet made by American manufacturers.

The American Industry.

The growth of the domestic tin plate manufacturing industry up to the end of the second quarter of the year, as exhibited in the reports of Col. Ira Ayer, fully maintained the opinion of its vitality expressed in our review of a year ago. During the last quarter for which official reports have been published, namely, that ending June 30, 1893, the production of American tin and terne plates was nearly 40,000,000 pounds or almost 50 times as much as that for the first quarter after the McKinley tin plate duty took effect. During the September quarter the manufacture fell to much below what it should have been, because so many mills and tin houses were constrained to suspend operations in consequence of the general financial stress, wage disputes, &c. Nevertheless, the output was on a very fair scale, considering all the disturbing elements. The December quarter has seen the resumption of nearly all of the suspended works, and its record of production will, doubtless, make a good showing.

New Works and Extensions.

During the year several new tin plate works have started up, including one or two of the first magnitude, notably that of the New Castle Tin Plate Company, New Castle, Pa., and the large plant of E Morewood & Co., at Gas City, Ind. A number of others have increased their size and capacity by erecting larger buildings or by the provision of additional tinning machinery. Only two or three concerns have suffered by the prevailing stringency to the extent of failure or suspension.

Taken as a whole, therefore, the American tin plate manufacturing industry has displayed a remarkable degree of stability as compared with most other enterprises. The effect that the change in tariff on tin plates and black sheets, as proposed in the Wilson bill, will have on the nascent industry remains to be seen, but to many cool and impartial minds in the trade the prospect does not seem to promise such alarming results as were at first freely predicted by domestic manufacturers and others. The impression held on the subject by some of the manufacturers will be gathered from the extracts we have before given.

Improvements in Manufacture.

A general showing toward economy and efficiency in the manufacture of tin plates has been a marked feature of the year's trade history. American invention has been stimulated toward the improvement of tinning machinery, and several patents have been awarded in this line, as well as for new coating processes and for labor saving machines for cleaning and polishing plates, &c.

American Black Sheets.

The increase in the home manufacture of black sheets for tinning purposes has been quite notable, as well as the improvement in their quality. A growing number of mills are now making a specialty of this material, and report a ready demand for all they are able to produce. Prices of black sheets have also been lowered to such an extent as to make their use, in point of economy, a desirable object to those concerns which do not produce their own. The proportion of American tin plate works that now use domestic sheets exclusively has increased every month, and of all the tin plate now dipped in this country at least 50 if not 60 per cent. is made of sheet steel rolled in the United States. The American roofing plates have now so established their reputation as to have virtually ousted the imported material from the market, while the bright plates turned out by the home makers are admittedly unsurpassed in quality.

The Metal Market in General.

We print, in conclusion, an interesting memorandum on the tin plate and metal market issued by the well-known firm of Bruce & Cook of this city, which contains a valuable review of the situation from the jobbers' point of view. They write on January 1, 1894, as follows:

We regret that a more favorable report of the year just closed cannot be given. The early spring disturbance in the monetary affairs of this country came so suddenly, and with such force, as to almost completely upset all calculations in regard to future business transactions, and its results were so disastrous as not only to make serious losses in the decreased value of all kinds of merchandise, but also caused more or less distrust in all lines of credit. It would appear that this disturbance was caused more by fear than by any actual conditions which would warrant so great an amount of distrust. The legislation at the special session of Congress, called specifically to deal with the currency question, was such as to insure, we hope for many years to come, a strong and solid foundation for our currency.

The question of tariff revision which is now before the country will no doubt keep matters in a more or less unsettled condition until it is finally passed and the country adjusts itself to the new conditions under which business may be done. Meanwhile uncertainty as to the exact changes to be made and the date upon which they shall take effect will hamper all lines of industry which are affected. It seems to us that the sooner the matter is acted upon and settled definitely the better it will be for the prosperity and well being of the country. For several months there has been a large decrease in the production of all lines of goods, especially those connected with metals; and while there is no question that consumption has also decreased, and that there are a large number of men out of employment, we see no reason why a return to former prosperity may not be looked for early in the coming season, especially if before that time tariff matters are finally adjusted. Without exception, all goods in the metal line are at exceedingly low prices, and any return to the usual output of manufactured goods must give an increased impetus to labor and manufacturing, which will equal, if it does not exceed, that of former years.

It is a source of gratification to be able to say that nearly all branches of the metal and kindred trades have shown remarkable strength during the last few months, and we think a smaller percentage of resulting failures has occurred than in almost any other distinct line that can be named. We believe this is owing largely to the method of doing business, which is mostly for spot cash, or on very short time.

SCRAP.

ST. LOUIS STAMPING COMPANY, St. Louis, Mo., report a large and increasing demand among Western consumers for their American roofing plates, including the S. L S. Old Process, S. G., and Extra Fine. So much is this the case that their product in this line is absorbed as fast as it is turned out from the company's works.

JOHN HAMILTON, 62–64 Third avenue, Pittsburgh, Pa., manufacturer of Hamilton's Best Redipped American roofing tin, is sending out to the trade pads for memorandum purposes, which will doubtless be found very useful by those receiving them. At the top of each sheet in the pad appears a statement commending the qualities of this brand of roofing plate, while on the body of the sheet appears the words in light letters, "Hamilton's Best Redipped American Roofing Tin." The object sought is to keep this brand constantly before the trade, and it will no doubt

be attained. All through the severe business depression existing during the last six months of 1893 this firm have been in operation right along, meeting with a ready demand for their plate. The outlook for this year is exceedingly encouraging, as it is believed that building operations this year will be much more extensive than last year.

In refutation of the oft-repeated statement that tin plate was not and could not be made in this country on a commercial basis, we are permitted to give below the amount of monthly sales of tin and terne plate made during 1893 by one of the prominent concerns located in the West. In presenting these figures the fact should be noted that the entire works were closed down for about ten weeks last summer, during which time not a wheel was turned. The total sales represent only tin and terne plate, with the exception that early in 1893 a few tons of black sheets were marketed by the firm. The monthly sales of the concern in question for each month of 1893 were as follows:

January	$30,843.04
February	40,795.60
March	66,239.60
April	49,546.77
May	65,017.54
June	32,272.67
July	22,193.18
August	14,960.62
September	47,639 27
October	46,406.68
November	49,864 55
December	47,174.54
Total	$512,954.06

The above figures are absolutely reliable, having been taken from the books of the firm.

Hardware and House Furnishing Goods.

THE year in the hardware and kindred trades has been one that the majority of manufacturers and dealers would not care to repeat. Like the other lines of business reported by *The Metal Worker*, these trades have suffered not a little since last January. In accordance with the general business situation prevailing throughout the country, the first six months of the year developed considerable activity, and if the final balance could have been struck on July 1 the majority of business houses would have looked back on a prosperous season. Unfortunately, however, it was not possible to sleep through the remaining six months, and the losing trade of the last half of the year more than offset the profits of the spring.

Hardware.

In the hardware and miscellaneous house furnishing trades, the reports that we have received from manufacturers, jobbers and dealers show a considerable falling off—hardly any report a gain—the average losses being in the neighborhood of 25 to 30 per cent. While the record of the past is invariably gloomy, the outlook for the future is not considered so hopeless—that is, opinions vary considerably, and not a few of our correspondents are adverse to prognostications of any sort. They point out certain good features in the situation, and likewise draw attention to evil tendencies at work. It is not considered, however, that in the immediate future there is to be much resumption of activity or any betterment in prices. An example of the effect produced in the house furnishing trade by the financial stringency of the summer is well indicated by the figures furnished us by a firm in the central western part of the country. During the months of August, September and October their business declined 33⅓ per cent., as compared with the same period last year. In November the reduction was 25 per cent., and in December the falling off was 20 per cent. The sum total for the year being practically the same as last year, indicated that during the first six months a very considerable increase in activity had been enjoyed.

It would surprise, in some measure, the politicians of all sorts to learn how very general the feeling was against the political activity that has afflicted the country during recent years. Examples of the opinions held on the general question of tariff, without reference to the particular changes recommended, are shown in some of the letters, from which we quote as follows :

One of the manufacturers in New Jersey says : "Give us a stable system of finance, a sound national bankrupt law and an equitable tariff of a permanent character and the future will be prosperous. However, as the tariff is the only bone of contention between both parties, it is certain that the discussion of the question will continue for years Therefore the effect upon business will be to put manufacturers to their wits' end to know what course to follow in making stocks, the value of which may be changed from 10 to 25 per cent. by tariffs created by men most of whom are fourth rate country lawyers who are fond of tinkering with the tariff."

Tinware.

The record of the year as furnished by tinware manufacturers is in keeping with the reports that have come to us from other makers of housefurnishing goods, hardware and similar articles. Practically all of them have done less business during 1893. The largest reductions amount to about 50 per cent., unless we include certain unfortunate concerns who were driven entirely out of existence by the financial stringency and other difficulties of their business. The average would show about 30 per cent., and this loss meant a much greater falling off in business during the last half of the year, for the business up to July was in most cases prosperous and greater than during the same season a year ago. One very prominent firm of manufacturers describes the situation by saying that, in spite of increased facilities for doing work, their business had decreased 30 per cent. from last year.

The future is unsettled, but most of our correspondents do not take a very rosy view. Some think that the first six months of the year will be dull and bad, and that after July 1, or thereabouts, there will be an improvement in industrial conditions. Others point the period of depression with the settlement of the tariff question, and think after that business will improve. There is a variety of opinion on the tariff question among the manufacturers of tinware, some of them holding that while it is probable that the tariff proposed in the Wilson bill will reduce the price of the raw material, yet the general effect on the country at large will be harmful, and that therefore, indirectly, they will suffer.

Refrigerators.

Among the most favorable reports we have received in regard to last year's business are those from the refrigerator trade. Save in one or two instances, where exceptional circumstances were operative to depress business, manufacturers of refrigerators all speak of the very satisfactory volume of business during 1893. This, however, is almost wholly due to the exceptional position of the industry. The trade in these goods is largely confined to the spring and early summer months, and but little business is usually looked for after July 1, the period from which most trades date the beginning of decline, consequently the financial stringency affected this industry to but a small extent. Its influence will probably be more felt during the coming season, for the reason that the lack of money will prevent many people who would otherwise have used these goods from investing in them. As a Western manufacturing concern express it:

It is the laboring class at the present time who are the large purchasers of refrigerators. The wealthier people have used them for years, while the poorer people are just beginning to recognize them as a necessity. Should tariff legislation cut off to any large extent the income of the working classes, they would be obliged to get along without refrigerators as they have done in the past.

The tendency in "season goods" has been to make the manufacturer carry the stock. Last season, we learn, many orders were lost owing to this being the case. There is, however, an indication that jobbers are inclined to change this idea to some extent, and to lay in at least a fair working stock before the season opens.

Several of our correspondents complain that their margin of profit has been adversely affected by reason of bad debts caused by the financial stringency. We are informed by a manufacturing firm in Wisconsin that their 1893 trade was double that of 1892, and that their sales for delivery in the present year already exceed their deliveries during the past year. This concern are probably exceptionally fortunate in this respect, and their experience is, therefore, no criterion of the condition of the refrigerator trade in general. They consider that last season was the best year for the sale of refrigerators on record.

A general tendency is noted to improvement in goods in the direction of efficiency and decorative effect. The majority of concerns report having enlarged their facilities or added to their lines of manufacture during the year. Competition has not increased to any sensible extent.

STOVE TRADE NOTES.

The Stove Trade of 1893.

BY GEO W COPE.

THE CONTRAST between the stove trade of 1892 and that of 1893 was marked. The good condition of business which had prevailed for several years culminated in 1892, when the demand surpassed anything known in recent stove history. Everything in the line of cooking and heating apparatus found buyers. The record of 1893 was very different.

The Financial Panic.

The usual preparations were made by manufacturers for a fair year's business. Spring trade was of about its usual proportions, but when midsummer came, and the time had arrived when manufacturers were wont to fill their books with orders for fall shipment, the chill wind of a financial panic was sweeping over the country, blighting all enterprise. July and August are ordinarily months of heavy business, but 1893 proved a woful exception. Trade was dealt a staggering blow. Orders that had been placed early were countermanded. Credits were so seriously impaired that salesmen were withdrawn, because it was uncertain that goods would be paid for even if contracts should happen to be secured. Money suddenly became so scarce that foundries were shut down wholesale for lack of actual cash to meet running expenses and pay workmen. Fully three-fourths of the stove manufacturing capacity of the country is estimated to have been idle in August, at a time when the utmost energy is usually put forth to prepare for the fall trade. Many large foundries were closed for two months, and it is believed that the output for the year was thus reduced at least 500,000 stoves below what it otherwise would have been. Never before were manufacturers plunged into such a sea of uncertainty. A few failures occurred, but the number fell far short of what was feared, as rumor with its thousand tongues was busily attacking the credit of even the stanchest and best managed establishments.

In September there was a decided revival, as the crops proved fairly satisfactory and money was much easier. October was a month of excellent trade. Winter weather made its *début* in November, earlier than for several years, and caused something of a rush for heaters, but after that trade fell off again. Before the close of the year notices that stove foundries were shutting down grew painfully numerous in the daily newspapers.

Molders' Wages.

With the bad record of the year now spread before us the fact can be more fully realized how ill-timed was the demand for an advance in molders' wages which was made last spring. The workingmen based their claims on the prosperity of the preceding years and were determined to get a greater share of the benefits which they expected the trade to secure in 1893. Although some of their leaders refused to admit the soundness of the argument put forth by manufacturers that it was unreasonable to expect a prosperous stove trade in 1893 with general business languishing, discretion and common sense fortunately prevailed in the counsels of the labor managers. Threats of a strike for higher wages, which were so freely made in the spring months, became less forceful and were at length completely dropped when it was seen that molders might considers themselves fortunate if they were able to secure steady employment at their old wages.

If an advance had been conceded and the suggestion made by the workmen had been adopted that the price of stoves be raised to cover the increase in cost, it is now perfectly plain to all that the action would have been most unwise. It would have been a most unfavorable time to attempt to raise the selling price of stoves, even if supported by such an excellent excuse as an advance in the cost of manufacture.

Careful Methods.

The small number of failures among stove manufacturers during the year can be attributed, in great measure, to the fact that values were on a low plane when the panic was precipitated. There was very little room for shrinkage, as there was no inflation to be squeezed out. The resumption of manufacturing operations after the summer suspension brought with it no heavy depreciation in the value of stock on hand.

As the panic fortunately occurred between seasons and not while heavy accounts were outstanding for stoves sold and delivered, manufacturers were thus specially favored. It may be vexatious to be obliged to closely scrutinize credits, and disagreeable to deny old customers the full measure of confidence they enjoyed in former years, but it unquestionably has its advantages over worrying with bad debts and uncertain collections. The shortening of credits by manufacturers also had a salutary influence on a large class of retailers, who found themselves obliged to be more conservative in dealing with their customers, refusing time and insisting upon cash.

Matters are now in such shape throughout the stove trade generally that if times should materially improve next year manufacturers will be immediately and beneficially affected.

Stocks in retailers' hands and in makers' warehouses are light, perhaps lighter than for any year within the last decade. An improvement in the consumptive demand will therefore be communicated at once to manufacturers. That they are in better shape than ever to handle a heavy business is shown by the

Numerous Improvements in Plant

which have been made all over the country during the year in the stove and allied trades. There may have been some important improvements which have escaped the attention of the correspondents of *The Metal Worker*, but those which have been noted in our columns since January, 1893, are worth enumerating for their variety and in many instances their magnitude.

The Michigan Stove Company erected a new warehouse building at Detroit, 156 x 50 feet, to be devoted exclusively to the storage of castings and supplies.

George M. Clark & Co. of Chicago added to their old quarters an entire building, 150 x 50 feet, and five stories and basement in hight. They also took possession of two more floors in the manufacturing block in which their factory is located.

The Irwin Mfg. Company of Louisville, Ky., built an addition to their foundry, 50 x 30 feet, two stories in hight.

The Art Stove Company of Detroit increased their motive power for the third time since they commenced business, built an addition to their molding department and made other substantial improvements in their manufacturing facilities.

The Scranton Stove Works built an entirely new plant at Dunmore, Pa., fully equipped in every department for the rapid production of high grade goods, pouring the first heat on July 18.

The Taunton Iron Works Company of Taunton, Mass., erected a three-story

building, 60 x 50 feet, to be used as an addition to their mounting room and for storage purposes, as well as for offices.

Noyes & Goddard, at Waterville, Maine, poured the first heat in their new foundry on January 25.

The Brand Stove Company of Milwaukee completed a substantial building, 150 x 102 feet, four stories and basement in hight, to be used for offices, warerooms and storage of finished stoves.

The Kernan Furnace Company of Utica, N. Y., made extensive improvements in their works to meet the requirements of their constantly growing trade.

The Stuart & Peterson Company removed their works from Philadelphia to Burlington, N. J., where they have a thoroughly equipped modern foundry and enjoy greatly increased facilities for the production of stoves.

Buck's Stove & Range Company of St. Louis built a four-story warehouse over their foundry, making a substantial addition to their already extensive works.

The Ringen Stove Company of St. Louis topped their manufactory with another story, thus adding 200 x 75 feet of space, which was imperatively needed for the accommodation of a greater working force.

The Lehigh Stove & Mfg. Company of Lehighton, Pa., built an extension to their foundry, 74 x 64 feet.

The Joseph Bell Stove & Range Company abandoned their old works at Wheeling, W. Va., and commenced operations in the new plant at Muncie, Ind., on May 31, with three times their former capacity. A warehouse is still maintained at Wheeling from which to supply the Eastern trade.

The Ohio Stove Company of Portsmouth, Ohio, erected a large building to be used as an office and warehouse.

The Century Stove Company of Dighton, Mass., made an addition to their foundry and otherwise enlarged their producing capacity.

Foster Bros., proprietors of the Central Stove Works, at Lebanon, Pa., completed a well equipped plant, which was put in operation in the autumn.

E. Bement & Sons of Lansing, Mich., built an extension to their foundry, erected a large warehouse and made other improvements in their works, considerably extending their manufacturing facilities.

The Carton Furnace Company of Utica, N. Y., considerably increased their productive capacity.

The Detroit Stove Works have built a warehouse in Chicago, 200 x 112 feet, five stories in hight, which will give them more storage room and improved shipping facilities.

The Indianapolis Stove Company of Indianapolis, Ind., made additions to their foundry.

The Abram Cox Stove Company of Philadelphia erected a huge building, 500 x 126 feet, six stories in hight, to contain their offices and salesrooms, mounting department, tin and pattern shops, and also to provide needed storage room.

Knott, Harker & Co. of Beaver Falls, Pa., erected a two-story office building and machine shop, 80 x 40 feet.

The Quick Meal Stove Company of St. Louis erected a four-story structure, 140 x 59 feet, to be used exclusively for manufacturing. An increase in their business of 30 per cent. in one season is justification for the expansion in productive capacity.

The Thomas Roberts Stevenson Company of Philadelphia built additions to their plant, consisting of a foundry, 100 x 47 feet, and a three-story warehouse, 66 x 33 feet.

The Richmond Stove Company of Richmond, Va., erected a three-story office and warehouse building, 80 x 46 feet.

The Favorite Stove and Range Company of Piqua, Ohio, made further additions to their extensive plant, greatly increasing their capacity. The company were among the plucky minority in the trade who persisted in running full time during the panic.

The Bloomington Stove Company of Bloomington, Ill., built a new boiler and engine house and made other improvements.

White, Warner & Co. of Taunton, Mass., built a new foundry, 75 x 60 feet, so as to be able to employ a larger force of molders.

Hart & Crouse of Utica, N. Y., have prepared plans for new buildings to be undertaken in the spring, which will greatly increase their producing capacity.

The Raymond & Campbell Manufacturing Company of Middletown, Pa., have made an addition to their boiler shop, 78 x 30 feet, which was greatly needed to relieve the pressure on other departments.

A new stove foundry is being built at Fulton, Ill., on the Mississippi River, by the Mississippi Valley Stove Company, who will acquire the business of the Ohio Stove Company of Tiffin, Ohio. The works will consist of six fine brick buildings with metal roofs, and their manufacturing capacity will be considerably greater than that of the old works at Tiffin.

The Tuttle & Bailey Mfg. Company of New York and Boston opened a branch house at 136 Lake street, Chicago, to provide better facilities for supplying their registers to the Western trade.

The Armstrong Stove and Mfg. Company have succeeded Armstrong & Co., at Perryville, Md., and will extend their business.

The Pittston Steel Range Company have been organized at Pittston, Pa., for the manufacture of steel ranges.

The Jackson Mfg. Company of Hammond, Ind., is also a new concern organized during the year to manufacture stoves.

Fires.

Losses by fire during the year were not large when the extent of the stove trade is considered. Quite a number of unimportant fires occurred, but about the only ones worthy of mention were the following: Walker & Pratt Mfg. Company's warerooms in Boston and the Milwaukee Gas Stove Company's plant in Milwaukee, both of which were burned in January; Bridgeford & Co.'s warehouse in Louisville, Ky., and the foundry of the Lincoln Stove and Furnace Company, in Lincoln, Neb., in October; a small portion of the Peninsular Stove Company's plant in Detroit, and the Schmalzried Stove & Range Company's plant in Memphis, Tenn., in November; the warehouse and part of the molding department of the Auburn Stove Company, Auburn, Maine, and the plant of the Hanging Rock Stove Works, at Ironton, Ohio, in December. From the small size of this list stove works should be considered good risks by insurance companies.

Failures and Changes.

The most important failures during the year were those of the Sioux City Stove Works, at Sioux City, Iowa; the National Vapor Stove & Mfg. Company of Cleveland, Ohio, and the Wells Mfg. Company of Greenfield, Ind. The W. J. Loth Stove Company succeeded to the Waynesboro Stove Company of Waynesboro, Va.

Generally Interesting.

The World's Fair at Chicago, which has now passed into history, was a topic of much interest to stove men while preparations for the event were in progress. Ambitious plans were formed for the proper representation of the stove trade at this great gathering of the world's best products, but one by one they came to naught, and finally it was left to individual manufacturers to do what they thought best. The result was that the display made, while highly creditable to those who participated, fell far short of what had been expected from so great an industry. Many very prominent concerns were wholly unrepresented. What was lacking in quantity, however, was atoned for in quality. In this respect the display was superb. At no previous exposition were such stoves shown, so complete in all their appointments, artistic in appearance and rich in ornamentation. Every manufacturer aimed at originality in the construction of a booth or the arrangement of the exhibits, with most striking effect. Very few of them received awards, however, as at an early day during the progress of the exposition the great majority of the stove exhibitors withdrew their goods from competition and

declined to have them examined for premium or award.

An episode of the exposition is here worth mentioning. After the terrible calamity of the burning of the cold storage building, on the fair grounds, through which so many of the firemen lost their lives, the Michigan Stove Company offered to donate their highest cost and highest finished Garland cooking range and heating stove for the benefit of the firemen's families. They were to be disposed of by the sale of tickets, and the goods were to be delivered at the close of the exposition. The entire proceeds were to be handed over to the exposition authorities, whose approval of the scheme was asked. It was expected that several thousand dollars could be realized in this way, and the relief fund correspondingly swelled. But permission was refused, and the scheme was, therefore, dropped.

The Detroit Stove Works contributed greatly to the enjoyment of their patrons by running the Jewel Tally-Ho coach daily between the company's Chicago headquarters and the World's Fair grounds. Arrangements were made in advance for the passengers for each day, so that there was no confusion nor disappointment, and a large number of people from every section of the country enjoyed the company's hospitality. It was a six-mile drive over some of the finest boulevards in the world and through the most elegant residence section of the city.

The Brand Stove Company of Milwaukee celebrated the twenty-fifth anniversary of the establishment of their works on November 11. Invitations were issued to a large number of friends and patrons, who gathered at the company's offices and extended their congratulations.

On July 22 Isaac A. Sheppard of Philadelphia rounded out a half century of active participation in the stove trade, and the event was duly celebrated by a banquet at Warner Hall, Philadelphia, with 200 of his employees present. He served his apprenticeship with Warnock & Co., beginning in 1843, and in 1859 started in business on his own account.

Great records have been made in the gasoline and gas stove trades this year. George M. Clark & Co. of Chicago took what they believe to be the largest single order ever given directly by a consumer for gas ranges. It was for 128 with water heaters and 97 without, or a total of 225. These ranges were to be used in a large Chicago apartment house.

The Ringen Stove Company of St. Louis shipped the largest single car of stoves ever sent over any road in the country. The car, which belongs to a private individual, and was rented for the purpose, is 52 feet long, 10 feet wide and 11 feet high, and it was loaded with 300 stoves, mostly large sizes.

The Quick Meal Stove Company of St. Louis shipped 12 of their largest size and six picnic stoves to Johannisburg, South Africa. They enjoy a considerable export trade with a number of foreign countries. In the city of Milwaukee, with a population of about 225,000, no less than 2600 gas stoves were placed from January 1 to October 1.

Association Affairs.

The events of the past year have shown that stove manufacturers have by no means lost interest in the National Association. On March 16 the Stove Founders' National Defense Association met at Chicago to consider the propriety of advancing molders' wages 16 per cent., which had been asked for by the Molders' Union. It was decided that the condition of the trade and the business outlook for the year did not warrant an advance, but action was deferred until the next day, when a general meeting of stove manufacturers was held, which was well attended by stove manufacturers from all sections of the country. After full discussion of the subject they also came to the same conclusion, but being anxious to avoid a rupture with their workmen they arranged to have final decision postponed until the regular meeting of the National Association of Stove Manufacturers, which was to be held in Chicago on June 1. On the day preceding this meeting the regular annual assemblage of the Defense Association was held, at which the following officers were elected :

President, Henry Cribben of Chicago.
Vice-president, W. T. Bradberry of Pittsburgh.
Secretary, D. M. Thomas, Union Trust Building, New York.
Treasurer, A. C. Mott of Philadelphia.
Chairman of Committee for the Second District, Grange Sard of Albany, N. Y.
Chairman of Committee for the Third District, W. W. Baldwin of Cleveland, Ohio.
Chairman of Committee for the Fourth District, Chauncey H. Castle of Quincy, Ill.

The salary of the secretary was advanced 50 per cent. This action, together with his re-election, was a signal refutation of the charge made that general dissatisfaction was found with his administration of the office. When the National Association met on the next day a committee of molders appeared by invitation and the question of an advance in wages was again thoroughly discussed, with a positive decision against it. The matter was then wisely allowed to rest by the workmen, although for some little time there was apprehension of a strike.

Among other business transacted on this occasion was the election of the following officers:

Geo. D. Dana, St. Louis, president.
C. S. Prizer, Reading, first vice-president.
A. M. Blakesley, Rock Island, Ill., second vice-president.
D. M. Thomas, Union Trust Building, New York, secretary.
W. S. Stevenson, Philadelphia, treasurer.

The Board of Managers chosen was:
H. W. Buttorff, Nashville.
Henry Cribben, Chicago.
C. A. Ducharme, Detroit.
E. W. Peck, Rochester.
W. E. Walker, Taunton.

The members of the association expressed their satisfaction with the secretary by not only re-electing him, but also advancing his salary $1000 per annum.

Deaths in 1893.

Quite a number of men of prominence in the stove trade died in 1893. The list is headed by James B. Taplin, president of Taplin, Rice & Co. of Akron, Ohio, who died in January in his eighty-first year.

In February Thomas A. Westcott of Boston followed, aged 70, and actively engaged in the stove business until the day of his death.

In April Merritt Peckham passed away at Utica, N. Y., aged 80. He had retired from active business a few years before, but continued to give his firm the benefit of his advice.

During the same month Major M. P. Low of New York also died, aged 78. All these were veterans who had reached or passed the allotted three score and ten.

In May one of the younger generation of stove men died at Detroit, Patrick G. Breen, aged but 43. Mr. Breen had advanced from the molding floor in the Detroit Stove Works to a managing position in the Michigan Stove Company, and in 1889 secured an interest in the Peninsular Stove Company and became superintendent of the manufacturing department.

During the same month James Jones died at Utica, N. Y., aged 69. He was superintendent and one of the directors of the Carton Furnace Company, which he had helped to organize.

In June, at Troy, N. Y., James Morrison died, aged 81. Although not connected with the stove trade in his later years, Mr. Morrison was at one time a very prominent stove manufacturer.

J. M. Thatcher, inventor of the Thatcher furnace, died at Franklin, N. J., on July 19, aged 75.

At Cincinnati, on September 1, occurred the death of John Van, the inventor of the wrought iron range, who was upward of 80.

In the same month J. H. Beach died at New York in the sixty-fifth year of his age. He was one of the founders of

the Bridge & Beach Mfg. Company of St. Louis.

Henry C. Burgie, who had retired from the stove business but a year, died at Chicago in October, aged 63.

Also in October died John P. Barstow of Norwich, Conn., aged 71. He had been in the stove business since 1844.

In November, at Quincy, Ill., William V. Channon died, aged 81. Mr. Channon was president of the Channon-Emery Stove Company and had resided in Quincy for 45 years.

In the same month occurred the death of Edward D. Ransom of Albany, N. Y., aged but 42. He had been prominent as a stove manufacturer for a number of years, but latterly had been engaged in the foundry facing and supply business.

In December, at Milwaukee, Fred. G. Brand, secretary of the Brand Stove Company, died at the early age of 34 years, having been an invalid for many months, seeking health in vain in milder climates.

On May 12, Col. Augustus S. Bement died. He was of the firm of E. Bement & Son, Lansing, Mich.

In November Sylvester P. Pierce died, who was president of the Pierce, Butler & Pierce Mfg. Company of Syracuse, N. Y.

Reports from the Trade.

We have received many reports from stove makers in various parts of the country. From these letters we make the following brief notes on the condition of trade in the different sections, and add a few extracts from some of the communications :

The New England Section.

The stove manufacturers in the New England States report for the past year, as compared with 1892, a decreased volume of business, ranging from 5 per cent. In nearly every instance the cause of the falling off in sales is attributed to the financial depression and the agitation of the tariff question. The outlook for the new year is regarded as uncertain and the volume of business likely to show a heavy shrinkage.

A well informed stove man, commenting on the situation, says:

We have now become pretty well accustomed to hard times, and while we do not look very hopefully on the immediate future of our business, we propose to go on living happily, making the best we can of the times as we find them. We doubtless did our full share of worrying and fretting during the summer months.

Another manufacturer in summing up the situation considers that he gained during the past year as many new customers as he lost old ones. Yet notwithstanding this the volume of his trade fell off about 20 per cent.

The Middle Section.

Moving westward and taking up the reports covering New York, New Jersey, Pennsylvania, Delaware and Maryland, very much the same conditions as above described are found to have existed during the past year. Manufacturers report a shrinkage in the volume of business and the outlook discouraging and unsatisfactory, although an occasional instance is found in which the writer considers the prospects favorable for as much business this year as was enjoyed in 1893. In a majority of cases new goods were brought out, improvements in plant made and extra efforts put forth to meet competition and secure a fair share of business. A prominent manufacturing concern in Western Pennsylvania states that their business made a more favorable showing than would otherwise have been the case by reason of the addition of a furnace department to their plant. Another Pennsylvania manufacturer writes with regard to the prospects for 1894 as follows:

If stock in dealers' hands is to be considered solely, we should judge the coming year to be a promising one, but we think the general trade condition of the country will be an important factor.

The Western Section.

In the States west of Pennsylvania and north of the Ohio River, manufacturers report a shrinkage in the volume of business as compared with 1892 averaging about 10 per cent. In some instances the same amount of sales were made, in others it is said that up to July 1 the volume of trade was about 25 per cent. in excess of the previous year, while for the last six months there was a falling off of about 35 per cent. as compared with the corresponding period of '92. One of the most gratifying reports is that in which a manufacturing concern reports an increase of from 34 to 36 per cent. as compared with the previous year. Still another stove maker states that the year 1893 was the best in the history of the company. In all cases competition has been keen, and the margin of profit slightly less than the year before. A prominent concern in Ohio, in speaking of competition in their line, writes as follows:

Competition in its true meaning has had less effect upon us this year than for any year since we have been in business. This, we presume, was brought about by reason of the shortage of goods caused by the complete stoppage of many foundries during the late stringency. Proportionately the margin of profit is no less than last year, and we are inclined to believe that after all accounts for the year have been cast up, we will be more than pleased with the result in this respect.

With regard to the prospects for 1894, the impression seems to prevail that the outlook is anything but satisfactory, much depending upon the length of the discussion of vital questions by Congress, and upon results there accomplished. Generally speaking, the prospects are not very bright for the early months of the new year, although now and then a manufacturer is found who regards the future without fear, so far as the volume of his trade is concerned. One of the leading Ohio concerns, speaking on this point, says:

Looking at it from our standpoint we see nothing discouraging provided Congress acts promptly on the Wilson bill. Dilly-dallying with it will have the same effect as did their childish treatment of the silver bill—namely, keep the people in suspense. Give the people a base from which to work and they will forge out their own salvation.

With regard to the effect upon their business of the enactment of the so-called Wilson tariff bill in its present shape, the same concern say :

So far as it would directly affect us we do not fear it; while we are certain its effects would not enhance results if it dealt with us only, yet we believe it would not injure us. We believe, however, it will seriously affect the business of the country as a whole, and as we are fully dependent upon the prosperity of the whole country it would, of course, affect us through that channel. This is our opinion based upon a bird's-eye view of the past eight months. The shutting down of the woolen mills, iron furnaces, steel mills and a host of other industries, throwing out of employment a large number of people of a class who spend money freely when they have it, is bound to affect us in time. These things have actually taken place, and we believe all because of that plank in the Democratic platform declaring for a change in one respect of the revenue system of this country, and until something is definitely done with that proposed change we can look for no improvement.

A prominent stove manufacturer in one of the large Northwestern cities, in writing of the effect upon his business of the tariff discussion, says:

Our business is little affected by the Wilson tariff bill, because few stoves are imported into this country. Indirectly, however, we expect to suffer like every other industry by lower wages ruling, which, necessarily, must reduce the purchasing power of the laboring element and others. The panicky condition of the money market and the tinkering of the tariff cause stagnation and gloomy prospects for the future. We were obliged to shut down six weeks during the summer, which never occurred before during the 25 years of our existence.

Another prominent stove man in the same section of the country says:

In my opinion, the effect upon business of the discussion of the tariff question is very disastrous, as no one seems to know what to do or what position to take. The Wilson bill in its original form would, in my opinion, seriously injure our business, for the reason that it would cripple the general prosperity of the country. Of course we would not be afraid of direct competition in the stove trade from abroad, but unless the country is reasonably prosperous we cannot expect to sell as many goods as we have in the past.

Still another concern doing business in one of the Northwestern cities wiites as follows:

Through the Northwestern States business cannot be good this year, as the past 12 months have been a very hard year with them, and it will take at

least one year and good crops to recover from the present depression.

Speaking of the effect upon business of the tariff discussion the writer says:

The business of the country is in a very depressed condition. The patient is very sick, but as he has a good, strong constitution he will surely recover if let alone. Rest is what the country needs, not legislation. Congress should let the tariff alone, as its discussion unsettles and disturbs all branches of business, and no new enterprises will be launched so long as it continues. Such a measure is far too great and weighty for it to understand.

The Southern Section.

Throughout the South the business depression appears, from the reports at hand, to have been less manifest than in other sections to which brief reference has been made. In many instances stove manufacturers report about the same volume of business as during '92, the extremes ranging from 33⅓ per cent. less, which occurs in one case only, to 36 per cent. increase. In one instance a prominent manufacturer in a leading city of the South states that the volume of business for 1893 compared favorably with that of the previous year, which, however, was not the best ever enjoyed. In another case the manufacturer states that the volume of business was about the same, for the reason that facilities were increased and added efforts made to effect sales.

Competition was sharper than before, with a tendency in some sections to increase business at the expense of prices. This, of course, was not without its effect upon the margin of profit, and most manufacturers report a slight decrease in this respect.

The outlook for the future is not altogether encouraging, although stocks in the hands of dealers are light and any improvement at all in the general situation is likely to make itself quickly manifest in the stove trade. According to a leading manufacturer in Tennessee:

The disposition on the part of all is to "pull for the shore." That 1894 will be a dull, poor year for business is now generally conceded.

In writing of the effect upon business of the extreme depression which has prevailed, the manufacturer reported above says:

Payments have been delayed, business generally curtailed and failures and compromises increased. The effect of the tariff agitation is to delay everything.

Another concern doing business in Kentucky says, regarding the discussion of the tariff question:

It is a very disturbing element. We think if Congress would act quickly and settle the question, it would result in the starting up of many manufacturing concerns and business would at once improve.

A Virginia manufacturer writes as follows:

We cannot say that we have felt the financial stringency, as we have sold as many goods as in average years. With the exception of the time when the Senate was in session, collections were as good as usual. During the whole time, however, we did not have to borrow any money, so had only our fears to hamper us—no actual ghost coming near us. We do not see that the discussion of the tariff question has had any effect as yet in our special line, or if it does, the necessities of those needing stoves will overcome their theories on the tariff.

The Gasoline Stove Trade.

This year will be the fifth season for the new process gasoline stove. This stove was first tested by consumers in 1890, and met with immediate favor. There was much skepticism at that time among manufacturers of the old style generator stoves, who considered the new candidate for honors as a short lived weakling who might command some trade for a year or two on account of novelty, and would then gently fade and pass into oblivion. The new comer has, however, not only survived the perils of its first and second seasons but has made steady progress in supplanting the old system. It is estimated that about two-thirds of all the gasoline stoves sold in 1893 were new process stoves, and next year the proportion promises to be still greater, as all the manufacturers are bestowing most of their energy on new process goods. They are not neglecting the generator stoves, and continue to make improvements in that line so as to hold their trade at all points, but their greatest efforts are being made in their new process styles.

The results of the coming year are being awaited with a great deal of interest and some anxiety. While the stove trade, to a very great extent, moves in an orbit of its own, and is not usually much affected by prosperity or adversity in other branches of business, yet the depression in business now prevailing is of such an unusual character and so much more severe than any known for many years that the stove trade can hardly expect to escape from sympathetic influences which may restrict sales. It is true that in times of great prosperity stoves are not bought more freely, but only to meet the family necessity, and the argument may be made that necessities have to be provided for even when times are bad, but when rigid economy in domestic expenditures must be enforced it is surprising how the consumption of the greatest necessities can be curtailed. Still, it must be borne in mind that the largest part of the gasoline stove trade is done in rural communities either among farmers or those whose business is interwoven with that of farmers, and they are not so seriously affected by the business depression as manufacturing and commercial interests. Another point to be considered this year is the durability of the new process stoves, which have now been used long enough to be fairly tested. It is expected by some manufacturers that this year may develop a very great demand for repairs to the new process stoves sold in the years from 1890 to 1892, and if such repairs are of a more serious character than for the old style generator stoves a reaction in favor of the latter might be looked for.

This contingency, however, will be met by the manufacturers with the evidence in the later constructions that weak points have been strengthened and greater durability insured. Whatever defects may have existed in the earlier stoves have all been corrected as they developed, and the new process stove of to-day is as thoroughly reliable an apparatus as the generator stove had become when its rival sprang into existence. The further fact has also been demonstrated in favor of the new process stove that, in case a poor quality of gasoline is furnished by a dealer, the new process stove will continue to work with fair satisfaction under conditions which would cause and old style generator stove to clog up and almost, if not entirely, cease to operate.

It is noteworthy in this connection that very few changes have been made in the new process stoves since they were first brought out. The principle has not been modified in any important particular. Changes have been made in the construction of parts of the apparatus, to insure greater durability, as mentioned above, but the new process stove of 1890 looks very much like the new process stove which is now being made for the season of 1894. It was not the case with the old style generator stove, in which modifications were being constantly made and new patterns were brought out almost as regularly as the season changed. It is not often that a new idea, such as that of the new process stove, is brought forth in such well conceived shape that it is retained by a variety of manufacturers, all of them ingenious and all of them ready to seize with alacrity any improvement on the methods of their competitors.

Oil, Gas and Vapor Goods.

The volume of trade in oil, gas and vapor goods during the year just closed showed a gratifying increase as compared with 1892. This was in a large measure due, no doubt, to the growing popularity of gas and vapor stoves, especially during the summer months, and to the fact that in many instances where once introduced the cooking stoves were continued in use the entire year. This state of affairs was not without its effect upon the business in stoves using coal as a fuel. Reports from those engaged in the manufacture of oil, gas and vapor goods indicate a satisfactory business, all things consid-

ered, with sales in some cases reaching higher figures than for any corresponding year since the business of the concern reporting was established. Competition has been keen, with the result that the margin of profit has been somewhat less than during 1892, although among the concerns belonging to the Vapor Stove Association prices and discounts have remained about as heretofore.

Almost without exception the outlook for the new year is regarded by the manufacturers as uncertain and far from satisfactory. The general impression seems to be that the volume of business will be lighter during '94 than it was in '93, although now and then one is found who regards the prospects for the future as fairly encouraging. The depression existing in financial and industrial circles has had more or less effect upon the oil, gas and vapor stove trade, but the falling off in business has varied greatly with different concerns. In some instances the financial stringency appears to have caused no loss in the volume of trade, while in others the reduction, as compared with the first six months of the year, has ranged from 25 to 50 per cent. The tariff question is regarded as a disturbing element in the business situation, and until it is settled and confidence restored no marked improvement is expected.

Miscellaneous.

With regard to the trade in stove patterns, trimmings, repairs, stove polish, grates, mantels, &c., there is very little to be said which is not covered in the reports already presented. The same influences which affect stove manufacturers have a bearing upon those who furnish supplies, fittings, &c., and while the volume of business reported for '93 shows a falling off as compared the previous 12 months, the outlook in many instances is regarded as good, more especially in the stove repair line. This is explained by the fact that people are repairing stoves instead of purchasing new ones, and that as it will take several months, if not a year, to completely restore confidence, people will continue the plan of making their old stoves answer by putting in repairs rather than buy new goods. It is for this reason that stove repair men look for a larger trade this year than last. A prominent manufacturer of stove trimmings in the Eastern section of the country states with regard to the effect of the financial stringency that it was not injurious to his business. "On the contrary," he says, "it helped me. It was necessary, however, to work hard to keep up with orders and make prompt shipments. Slight losses were incurred through failures, but they were not important."

A maker of patterns for castings writes as follows: "With regard to the effect upon business of the passage of the so-called Wilson tariff bill in its present shape: In our opinion it would close up all stove manufacturers except those making first class specialties."

Another pattern maker expresses himself as follows:

I believe the prosperity of other nations benefits the United States, from the fact that we have the natural resources from which wealth comes, and as compared with other nations we would be prosperous in proportion to our natural resources.

ODD PLATES.

The Leibrandt & McDowell Stove Company, Philadelphia, have just set up the first stove from a new set of patterns, which not only pleases the eye but presents some attractive constructive features. The Stratford is an open stove that may well be called elegant. It has their new patent telescoping draft slide, and an ornamental cast iron curtain serves as a blower. This curtain is made in two parts and can be adjusted at any point desired to get the necessary heat and draft. The fire rests in a brick lined sheet iron niche and is agitated by a special arrangement of a simple bar grate. Air is taken from the floor underneath the stove and warmed by passing up between the inner and outer shells, and may be used for heating an upper room by means of a pipe. The Stratford is also made for use as a fire place heater and is adapted for different fuels.

The Albany stove foundries are busily engaged in taking inventories and making annual repairs. They hope to resume operations in a few weeks.

The Somerset Stove Foundry Company of Somerset, Mass., are distributing to their friends in the trade a very pretty calendar for the new year. It is lithographed in colors and arranged with a metal eye for hanging it upon the wall. Across the top of the card is the name and address of the company, with an indication of the line of goods manufactured; while at the bottom are attached the leaves for the different months of the year. In addition to the usual statistics the phases of the moon are presented.

Lewis Moore, secretary of the Joliet Stove Works, Joliet, Ill., has, by order of the Board of Directors, issued a notice to the effect that a special meeting of the stockholders of the company will be held on January 15 for the purpose of increasing the capital stock to $100,000, amending the by-laws and considering any other business which may come before the meeting.

Rathbone, Sard & Co. recently received at their Chicago office a letter from a customer in Minnesota, relating his experience with a stove purchased from them not long since. Wood was the fuel used by the purchaser of the stove, and one morning at 9 o'clock he filled the fire box with willow, which is said to have kept the fire for 27 hours. Any one who has had experience with burning soft wood will readily understand the difficulty of holding a fire for any length of time, and the record which has been made with the Acorn Radiator is a testimonial which cannot fail to interest the trade.

A charter was issued last week from the office of the Secretary of State to the Weir Stove Company of Taunton, Mass., the capital stock being $120,000. The officers include William E. Walker, president, and Charles E. Baker, treasurer.

The Somerset Stove Foundry Company, Somerset, Mass., send us a very pretty poster, lithographed in colors, and calling attention to the Somerset ranges, which include among others the Somerset Grand, the Somerset Jewel, the New Grecian, the Somerset Grecian, the Matron and Wyoming. Among the parlors we notice the New Somerset, Arion and Leo. We also have from the company a circular illustrating the Somerset Jewel, which is a substantial six-hole construction of attractive decoration. The company state that it is made from the best material and embodies the modern improvements.

The directors of the Auburn Stove Foundry, Auburn, Maine, have decided to repair the buildings recently burned and resume the manufacture of stoves as soon as circumstances will permit.

Joseph Huse & Son of 95-97 Blackstone street, Boston, Mass., are distributing, with the compliments of the season, a rather unique calendar for the year 1894. Attached to the upper left hand corner of a piece of heavy cardboard having beveled edges and measuring about 3 x 4 inches is a bag of dates, the contents of the bag consisting of chocolate colored slips of paper carrying the days of the week and months of the year. The lower part of the card is embellished with the statement that the firm were established in 1839 and are headquarters for range, stove and furnace repairs, as well as stove dealers' sundries. The calendar is sent out "as a reminder that if every day orders, however small, were given to the sender, mutual happiness and good feeling would exist not only at this present season, but throughout the entire year."

Century Stove Company, Dighton, Mass., are sending out a calendar attached to an engraving representing a horse's head, above which appear the words, "Always ahead!"

The Thatcher Furnace Company, of 33 Peck slip, New York City, and with foundry at Newark, N. J., report an increasing demand for their specialties and state that the business of the past year was far ahead of any corresponding period in their history. This is particularly gratifying, considering the many complaints of hard times and the general business depression existing in all sections of the country. The company have just brought out and put on the market a handsome double oven range, which is made in portable form and for brick setting.

The Chicago & Erie Stove Company of Erie, Pa., have always felt that they were an old concern, because, with their predecessors, they have been making stoves for more than 50 years. They have, however, recently received a letter from a customer in Lancaster, Pa., and representing a firm who have been in the hardware business for 130 years, and in that time have sold thousands of different kinds of stoves. In the letter to the company is the following statement, which must prove very gratifying to the manufacturers: "We feel secure in stating that never in the history of our business have we sold a range which is as near perfection as the Superb Helper. We have never had any difficulty in effecting a sale when we have shown this range to the best

class of people—those who want the best in the market. We have placed a number of them in this city and have heard nothing from their owners but words of praise. They all say its chief point of excellence is its asbestos lined, easily heated oven, which gives it auch excellent baking qualities and makes it a great fuel saver. Its strong duplex grates also strike buyera as a great point of merit." In having the patronage of the oldeat hardware house in America on first-class gooda, the Chicago & Erie Stove Company feel greatly encouraged and consider their efforts have been appreciated by the trade.

E. D. PURVES, repreaenting Southard, Robertson & Co. of this city, will call on the trade in New York and vicinity during the year. Mr. Purves is an energetic young man, and no doubt will meet with that succeas that accompanies pusb.

THE MATTHEWS MFG. COMPANY of Worcester, Mass., Ambrose T. Matthews, manager, have issued a new catalogue of the line of atove knobs, hinge pins, ateam pipe collars, ferrules, bicycle parts and sheet metal specialties, which they make in great variety. The gooda are shown by means of outline engravings, and in connection with each is given its number, size and price. Henry Gleason of 106 Beekman street, New York, is selling agent for the atove ornament department.

A CONVENIENCE that will be appreciated by merchants is a neat gummed label for marking goods with coat price and selling price which is being distributed by the Michigan Stove Company. The label is 1¼ x 1¾ inches, printed in brown ink and bears the Garland trade-mark at the top, while blank spaces for pricing are at the bottom.

G. M. SOVERHILL of Buffalo, N. Y., formerly connected with the Detroit Stove Works, will look after the interesta of the Danville Stove & Mfg. Company of Danville, Pa., in Western New York, Central New York and Northwestern Pennsylvania for 1894.

THE INDIANA STOVE WORKS, Evansville, Ind., will be represented by the following salesmen during 1894: W. H. Brumecke, Illinois, Southeastern Missouri and Arkansas; F. O. Headley, Missouri, Kansas and Oklahoma; W. F. Kargas, Iowa, Wisconsin and Minnesota; A. J. Schulz, Indiana and Nebraska; E C. Specht, Mississippi and Louisiana; J. C. Gorham, Texas.

Some Remarks on the Past and Future of the Stove Trade.

BY JEEMS.

"Man and boy, nigh on 50 year I've been in this atove business, and I think this is the worat year I ever saw. There have been no goods sold to apeak of, and what you did aell you couldn't get any money for, and I swan to man if they don't want you to give 'em the earth if they do buy anything. I am just sick of the whole thing, and I am going to do aomething else, sure as you're born, honey, and I ain't going to fool my time with thia cussed business any more after thia year."

This is what "ould Tim," our foreman, said as he came out of the store back in the shop and flung his apron on the bench a few nights ago. Tim generally tends atore when the old man goes out to supper, and a mighty good man he is. All the old timers like Tim, but he is a terror to their hopefuls if he don't feel good when they come in the shop for anything.

He knew them when they were "suckers," he says, "and they can't give me any back talk." But when Tim's fur lies straight he is very good company, and the youngsters crack jokes and lark with him to their hearts' content. But the fact is Tim is getting old, and, like many others, he lives too much in the past. The newness of the new has no interest for him. He has got the same old snip of a looking glass tacked up in the shop that he has used for the last 40 years, and I'll be hanged if I don't believe he has the same old towel that he hung up when he tacked up the glass.

Even the soap has an aged and hardened look. Tim was good-looking in his younger days, and he spruces up quite a bit now, and the "jours" often catch "ould Tim" interviewing his phiz in the mirror. He don't admit much about being old, but he is. The real fact is Tim is so well up in the history of the past that I am durned if I believe he thinks there is to be any future. You can hardly bring anything up but what Tim chimes in "that puts me in mind," and away he alides down hill and gets down to the "fall of '49 or the spring of '50," or perhaps "'32 cholera," when he worked for old Cunningham down in Water street. The cholera got so bad that he went to work for a farmer out at Cow Bay, L. I., who fed him bony fish and horae feet until he thought cholera would be a luxury.

So while Tim is a good fellow he is getting to be a durned old bore, with his headstrong "what we used to do," &c.

But Tim was not what I wanted to get at; it was the stove business. But it doea seem that there is always something interfering with the running of the busineas.

The atove business in the East has not been very satisfactory, either for manufacturera or dealera, although many have had their usual trade. Of course, all sorts of reasons are assigned for its shortcominga by dealers and makers. So far aa the general business of the country is concerned the press furnishes the reasons, or at least attempts to supply them, for all its failures last year, and the public at large accept them and quote them as the cause of all their woes. As a majority of the press are more or less partisan, partisan reasoning furniahes many more alleged causes of trouble than possibly a truthful and honest analysis of the situation would bring forth.

There is another thing to be considered about the stove trade. The increased use of steam, hot water and hot air furnaces, gas, oil and vapor stoves would seem to make it desirable to bring or put each style of goods under its appropriate heading and sum up each class by itself as to its doings.

The term "atove trade" is too general to cover the busineas now, and to say that the atove business is good, or not good, does not meet the aituation. If we take all the preceding goods under the head of stove trade we would possibly find that the trade for 1893 had been greater than ever—that is, more goods went into consumption—but posaibly fewer stoves were sold—at least, in the East. So far as the stove trade proper is concerned it has been as good as it could be—that is, the warm weather has been its greatest drawback, and all the cry of hard times, silver bill, tariff, &c., has had but a limited effect upon it. All those people who depend upon stoves strictly for heating and cooking have been favored up to date with moderate weather, and if economy was needed it could be easily practiced, but severe weather would have changed matters, and the atove trade would have showed its full consumption.

The branches of the atove trade enumerated before are steadily growing and increasing, and the plants, capital and volume of trade used in them are rapidly gaining on the atove trade proper. Putting all these divisions of heating and cooking under the head of atove trade, it will be found that its aales are increasing largely each year, and it doea not and will not go backward. But it will be a good deal like yachting was laat season: there were lots of fast boats up to the "Vigilant's" time, but they weren't in it and never will be again. So it is with the atove trade; it isn't what it used to be, and only the progressive "Vigilants" will find it fine sailing, and no doubt 1894 will develop plenty of new and startling departurea in the heating and cooking line, both in goods and methods of marketing them. There are lots of "Ould Tims" who do not realize where the stove business is; of course I mean the whole kingdom of heating and cooking apparatus. They know what it used to be, but they think it has gone to the dogs.

There is no such thing as the United States going backward. Perhaps it will be found that 1893 was a alow down to clean up and key up the machinery preparatory to running the machine on a acale that we have never yet seen. "This place never closed" may be observed placarded on many places, and plenty of other buainesses are never closed. The greatest era of proaperity the United States has ever known is coming and we are getting the machinery in bang up condition preparatory to "never closing." Don't aqueal if the past has not favored you; let it go, forget about it, and look to the front for the good things to come. You won't find them in the ash heap of the past.

TRADE REPORT.

The Iron Market.

The year 1893, just closed, will pass into history as the most disastrous that the great Iron industry has ever experienced. The misfortune is that its closing week has passed with even deeper gloom than any of the whole of 1893, and that as yet there are no signs which can inspire sellers with confidence or cause buyers to waver in the conviction that their next contract will be closed at better terms than they have yet secured. When buyers are told by the largest manufacturer in the country that they need only make their own terms to secure material it will take startling developments against them to put them in a frame of mind which will make advances possible.

The demands for a readjustment of prices on old contracts to conform to values actually ruling at time of delivery have been numerous enough without offering additional temptations to buyers to multiply them. The flexibility of contracts in this respect has been appalling, but in their helpless condition manufacturers have found it practically impossible to resist such unfair demands.

Transactions during the week under review have not been numerous. One of the most encouraging reports is that foreign interests have taken further quantities of Southern warrants, of which they are estimated to hold now about 35,000 tons. While, of course, this Iron may have a checking effect upon any rapid rise when it does come, the fact that it has been purchased proves that at last somebody has faith in the statement that bottom has been reached.

The following review of the Eastern Iron trade, furnished by our Philadelphia representative, affords an excellent summary of the general conditions prevailing in the Iron markets of the country in 1893 :

The year 1893 will be long remembered as the worst which has ever been experienced by manufacturers of Iron and Steel. The opening of the year was not such as to give great hopes in regard to the business outlook, neither was there anything to indicate the extraordinary collapse which set in during the summer months. The fact that important orders were pending from the shipyards and other large consumers, kept things in fairly good shape for a few weeks, but when something like 50,000 tons of Plates and Shapes were placed at figures which up to that date were unknown, the entire market commenced to show signs of weakness. From that date to the present—nearly a year—there has been practically nothing but a continual chipping away, and prices to-day are not only without precedent, but are lower than the most pronounced pessimist would have thought possible. Some decline has been met with in Pig Iron, $1.50 to $2 ℔ ton; some also in Billets, $5 to $6 ℔ ton, but in Finished Material it is difficult to say what the decline is, except that it is fully $10 on the lower grades, and probably $15 to $20 on the higher qualities; but there is no price to anything to-day, so that comparisons can only be made in general terms. Early in the year confidence received a severe blow by the suspension of payments by the Pottstown Iron Company, the Pennsylvania Steel Company, the Maryland Steel Company, the Reading Rolling Mill Company, the Philadelphia Bridge Works, and still later by the Wellman Iron & Steel Company. Receiverships for the Reading and Northern Pacific Railroad companies also had a depressing influence, so that from January 1 to December 30 there was one continuous line of disaster. With such a record for 1893 it is surely not unreasonable to expect a decided improvement during 1894. At the moment there are no indications of a turn in the tide. In some respects the outlook is the reverse of encouraging, though there is a general belief that some time during 1894 business will assume its normal condition, but it is not in sight yet.

Pig Iron.—The market for Pig Iron has been steadier than might be supposed considering the extreme fluctuations in other material. One reason, perhaps, is that Pig Iron led the way in the decline during the previous year and had gone so far that there was very little room for further reductions. Eastern prices have been more uniform than those in the West, partly because no Bessemer of any account has been made here of late months and partly because furnaces running on foundry and mill Irons decreased their output in anticipation of less favorable conditions. The result has been a decline averaging not more than $2 ℔ ton, and in some cases less than that. At the same time it will be noted that Pig Iron is at the lowest figures ever recorded, and lower perhaps than it can be produced for, except in a few isolated cases. There is nothing in the situation lately to cause any material change from present conditions. Those who have followed the monthly statements of furnaces in blast will see that production is a little over 90,000 tons per week, against something over 170,000 a year ago. This indicates an average reduction in the volume of business of 40 % compared with that during the early portion of 1893. The decrease in production of the furnaces west of the Alleghanies is about 49 %, and of those East a trifle less than 52 %, showing that the East is doing less in proportion than those in the West. The supply of Pig Metal is ample for all requirements, however, and unless there is some improvement in demand stocks will again begin to accumulate. Consumers show no disposition to place orders, however, and while they could engage deliveries for 60 or 90 days to come at as low or lower figures than ever before, they appear to be quite indifferent and take only such quantities as they need to cover present necessities. Prices vary according to circumstances, but ordinarily seaboard deliveries are about $12, $13 and $14 for the three leading grades and $11 @ $11.25 for an ordinary quality, but the market is unsettled and quotations subject to modification, according to quantity, brand, delivery, terms of settlement, &c.

In the Chicago market contracts have been placed for several round lots of local Coke Iron for delivery running through the first six months of this year. Special terms are usual on transactions of this character and low prices must be made now to meet the views of buyers to induce them to cover their requirements so far into the future. Southern sellers report a very small trade with prices comparatively firm on No. 3 Foundry and No. 2 soft, of which stocks have been pretty well cleaned up, but on other grades there is considerable pressure to sell. Freight rates from the South will be advanced 20¢ ℔ ton on January 15. Lake Superior Charcoal is very quiet, with no sales reported now in small lots. Quotations are now as follows for cash:

Lake Superior Charcoal.....	$15.50 @	$16.00
Local Coke Foundry, No. 1...	13.00 @	13.50
Local Coke Foundry, No. 2...	12.50 @	12.75
Local Coke Foundry, No. 3...	12.00 @	12.50
Local Scotch.....	13.50 @	14.00
Ohio Strong Softeners No. 1..	15.50 @	16.00
Southern Silvery, No. 1.	.....@	13.75
Southern Silvery, No. 2.....	.....@	13.25
Southern Coke, No. 2..... ...	11.90 @	12.15
Southern Coke, No. 3.....	11.40 @	11.65
Southern, No. 1, Soft.....	12.15@	12.40
Southern, No. 2, Soft.....	11.40 @	11.65
Tennessee Charcoal, No. 1...	16.00 @	16.50
Tennessee Charcoal, No. 2....	.....@	15.00
Southern Gray Forge.....	10.60 @	10.85
Alabama Car Wheel.....	18.00 @	18.50
Jackson County Silvery.....	16.00 @	16.50
Other Ohio Silvery.....	15.00 @	15.50

The following table has been prepared, averaged monthly from our weekly quotations, showing the range of prices at Chicago on leading brands of Pig Iron during the year. This table, however, is less accurate than for previous years, as it does not reflect the transactions known to have been made at cut prices when the condition of business was most demoralized. No. 1 local Coke, having been in but moderate supply during the year, was conspicuously firm. The sharpest competition occurred on Nos. 2 and 3, especially when sellers entered a contest for desirable orders with Southern makers. Some brands of Ohio Soft-eners were also sold considerably under regular quotations. Following is the table:

Months.	Local coke No. 1.	Lake Superior charcoal.	Ohio strong soft, No. 1.	Southern coke, No. 2.
January	$14.00	$16.50	$16.50	$13.75
February	13.75	16.50	16.50	13.50
March	13.50	16.50	16.25	13.25
April	14.00	16.50	16.25	13.00
May	14.00	16.50	16.25	13.00
June	14.00	16.00	16.25	12.75
July	13.50	16.00	16.00	12.75
August	13.50	16.00	16.00	12.75
September	13.50	16.00	15.75	12.50
October	13.50	16.00	15.75	12.50
November	13.50	15.75	15.75	12.25
December	13.50	15.50	15.75	11.75
Av'ge for year..	13.75	16.12½	16.00	12.75
Av'ge for 1892. .	14.50	16.75	16.75	14.00
Av'ge for 1891...	15.50	17.37½	18 00	15.00
Av'ge for 1890...	17.50	20.75	20.00	15.25
Av'ge for 1889...	16.75	19.37½	18.75	15.75

The last week of 1893 did not bring out any changes in the Pig Iron situation in the Pittsburgh district. Buying continues very light, prices are not strong and the market is weak. During the year there has been a decline of about $2 or $2.50 ℔ ton in Foundry Iron, and the demand for the last half of the year was considerably below that for the first half. With No. 1 Foundry at $11.75 @ $12, it hardly seems possible that values can go much lower, while if an improved demand should be met a slight recovery in prices early this year is believed to be not improbable.

There have been no favorable developments in the Southern markets for Pig Iron during the week. Of course, little business was expected during the holiday week, but such an utter absence of demand could hardly have been anticipated, for even the jobbing foundries in most districts have taken little individually and in the aggregate. The volume of business during the month of December was scarcely more than one-half as much as the corresponding month in 1892, and the outlook for January has few encouraging features. Buyers believe that they will lose nothing by waiting, and that the chances are strongly in their favor, but the stronger Southern Iron companies appear to have a considerable degree of confidence in the future. Quotations are as follows:

Southern Coke, No. 1	$11.75 @ $12.00
Southern Coke, No. 2	10.75 @ 11.00
Southern Coke, No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

The only news of interest in the New York market is the report that foreign interests have taken further quantities of Southern warrants, the amount involved being about 18,000 tons, which carries the total thus far contracted for by foreign parties to about 35,000 tons. It is understood that the prices were $7.50 in yard for No. 3 Foundry, and $8 for No. 2. We quote: Northern brands, $13.25 @ $14.25 for No. 1; $12.75 @ $13.50 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $13.50 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12 for No. 3; $11.50 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

Metal Market.

Pig Tin.—Business has been extremely quiet and the market remains bare of new feature aside from the change in the statistical position. In the latter connection the most remarkable fact is that the official estimate of consumption was reduced to 910 tons for the month of November, against previous estimates of 1600 tons monthly. The stock in the United States, excluding Pacific ports, is estimated at 1980 tons, and the amount afloat is 1005 tons. Prices have not fluctuated as much as the statistics, but the market shows rather poor form and it is no difficult matter to purchase ordinary jobbing parcels at about 20.60¢. Bids of over 20.50¢ for round lots have been extremely few and far between. Boustead & Co., Singapore, cabled Straits shipments during the last half of December as having been 2075 tons, making a total for the month of 3900 tons, against 2980 tons in December last year. Secretary Mayer of the New York Metal Exchange has compiled from official returns the following report showing the consumption of Tin in the United States during 1893:

"The official returns of the United States Bureau of Statistics give the following figures: Total importation of Tin into the United States from January 1 to July 1, 1893, the time when the import duty went into effect, 38,471,199 lb; of which were re-exported, 201,753 lb; leaving 38,269,446 lb; of which were imported into Pacific ports, 1,883,337 lb; leaving 36,386,109 lb; equal to 16,244 tons of 2240 lb for the United States, excluding the Pacific ports. Since the inauguration of the import duty the importation into the United States, excluding the Pacific ports, amounted to 746 tons, while the Pacific ports up to November 30, 1893, imported only 222 lb. According to these figures the consumption of the United States for the calendar year 1893 has been as follows: Stock January 1, 1893, 3500 tons; imports first six months of 1893, excluding Pacific ports, 16,244 tons; imports last six months of 1893, excluding Pacific ports, 746 tons; total 20,490 tons; stock in United States, January 1, 1894, excluding Pacific ports, 1980 tons; consumption, excluding Pacific ports, 18,510 tons; imports into Pacific ports taken as consumed there, 1,883,559 lb, equal to 841 tons; total, 19,351 tons foreign Tin consumed in the United States during the year ending December 31, 1893. The stock on January 1, 1894, of 1980 tons, as given above, includes 500 tons entered and still remaining in bonded warehouses. For the first time we are enabled to give the stock more nearly the actual figure than ever before. In our issue of August 8, 1893, we gave the consumption based on Government figures for the fiscal year ending June 30, 1893—viz., 21,053 tons; the calendar year shows only 19,351 tons. The apparent decrease of 1702 tons seems to be the result of the depressed state of business during the last six months."

The transactions in Tin on the Exchange during the year aggregated 20,405 tons, which is equal to about $10,000,000. During the same period there were 24,820 tons sold on the London market. The exports of Copper in 1893 amounted to 83,375 long tons.

Copper.—Business has been of strictly routine type and moderate all told. At least, such is the gist of reports made by sales agents and brokers. Such as they were, the dealings were chiefly at last week's prices, say 10¼¢ @ 10⅝¢ for Lake Superior Ingot, 9¾¢ @ 10¢ for Electrolytic and 9⅝¢ @ 9⅞¢ for casting stock, according to brand and quantity. Jobbing business during the week has continued to be on a very narrow scale. Quotations for small lots from store rule at 10½¢ @ 11¢ ℔ lb.

Sheet Copper.—There is but little movement in the trade at the present moment. Consumers are generally engaged in stocktaking and figuring out their future requirements. A week or two will probably develop more inquiry, but as building operations are at present very much restricted and as but little work in that line is in view during the immediate future—in the East at any rate—the prospects for any large business during the early part of the present year are very faint. A hand to mouth trade is all that is looked for.

Pig Lead.—Dealings have been on a very moderate scale and the demand fails as yet to show any signs of improvement. No particular pressure to sell is observed, but there seems to be quite enough Lead to go around, and prices remain soft at 3.25¢ @ 3 30¢ for ordinary Western brands. The consumptive demand is of the weakest, and prices are softer, 4¢ being the usual rate for small lots of Pig, while 3¾¢ has even been conceded by jobbers in some cases.

Lead Pipe and Sheet.—The apathy which has marked the Sheet and Pipe trade for several weeks gives no sign of coming to an end. Jobbers report that the demand is almost lifeless. Nor is any material revival looked for before the spring. Those in the trade who are best qualified to judge estimate the falling off in the volume of business during the past three months as being fully 40 %, as compared with the average for the present season. Collections are, nevertheless, reported as being unusually easy.

Spelter.—Sales here have been on a very moderate scale. The demand continues slow as well. Meanwhile the pressure to sell increases more or less and serves to keep prices on a very low level. Ordinary Western brands have been sold at as low as 3.55¢ @ 3 60¢, with an advance of 0.65¢ @ 0.70¢ ℔ lb on small jobbing quantities. Fancy brands bring about the usual premium.

Antimony.—There is a fair jobbing movement at about 9¼¢ @ 9½¢ for Hallett's and 10¢ @ 10¼¢ for Cookson's.

Tin Plates.—During the past week the demand for both prompt and future deliveries has continued rather disappointing, leaving the market in poor shape. Canners have mostly placed their orders for Cokes to cover their spring business, and some have anticipated their wants for as late as June and July. Such contracts have in all cases, however, contained a proviso in relation to possible tariff changes in the interval. Within the last day or two an increase in small orders, making the aggregate a fair amount, has been noticed by dealers in this city. These were probably held over by the smaller consumers until after the first of the year for financial reasons. The most satisfactory branch of the Tin Plate market is that of domestic Roofing Plates, which are in constant demand, so that there is no piling up of these products either at the works or in agents' hands. Stocks of imported Plates in New York are now fairly large, owing to the slack demand of the past few weeks, and the assortment good. Prices are somewhat soft and apt to be shaded on good offers.

A London cable dispatch to *The Iron Age* of January 3 reports the British Tin Plate market as being rather weaker. Inquiries have been rather more numerous, but buyers' views on prices were too low for the consummation of any considerable business. Stocks of Plates at shipping points are estimated at 252,000 boxes. Liverpool quotations are given as follows:

IC Charcoal, Alloway grade.....12/3 @ 12/9
IC Bessemer Steel, Coke finish. ...11/3 @ 11/6
IC Siemens " " " .....11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20.....11/3 @ 11/6
Charcoal Terne, Dean grade.....10/9 @ 11/

Sheet Iron.—The demand for both Black and Galvanized Sheets has fallen to the lowest point during the past week. Such business as has passed was exclusively in the shape of small lots for immediate use. Jobbers' quotations for small lots of Black Iron, although remaining unchanged nominally, are usually shaded for prompt cash, while a more liberal discount is allowed on purchases of Galvanized Iron.

Financial.

The year of Our Lord 1893 has dropped into the past with a sufficiently heavy load of financial and commercial disaster to stamp it in future history as one of almost unequaled gloom, and the last week displayed no lifting of the strain. It passed out with a pre-eminent record of dullness and depression in business circles, with one of the largest returns of failures in the year, with the prices of staples at the lowest notch, with a further shrinkage in values of railroad and industrial securities approximating them to the phenomenal prices of August, with a growing army of unemployed labor whose ranks are swollen to unprecedented proportions, and with the operations of many industries reduced to as much as one-half their normal volume, and those of most restricted to a very material extent.

Beyond these unfavorable symptoms, a constant falling off in Treasury receipts is announced which presents a a very serious condition. The shrinkage for the last six months of 1893, according to official reports, reached a total of over $34,000,000, mainly composed of heavy decreases in customs receipts and to a lesser extent in internal revenue, while expenditures for the same period show a comparatively small decrease of $5,800,000. So far as can be foreseen there is no ground for assuming that there will be any material change in these proportions in the near future, and the total shrinkage in Treasury receipts for the present fiscal year is estimated as likely to reach between $50,000,000 and $60,000,000. To relieve this incubus will be the weighty task of the Administration during the present year. At the close of 1893 the Treasury cash balance had fallen to $89,000,000, of which $81,644,000 was gold, with the certainty of a further decline in the reserve during the coming months unless the Government shall succeed in raising money by the issue of bonds or by other means.

In a comprehensive summary of the business features of the past year *Dun's Review* presents some very striking statistics, showing the disastrous effects on general business of the financial report of 1893. The commercial and banking failures far surpassed those of any previous year, both in number and magnitude. Those included in the former class reached a total of 14,212, with liabilities amounting to $331,423,000, which may be tabulated under the leading interests as follows, the last three ciphers being omitted for convenience:

	Manufacturing.		Trading.		Others	
New England	482	$12,065	1,290	$14,820	24	$2,766
Middle	1,149	100,700	2,035	25,757	80	13,136
Southeastern	358	10,106	2,096	20,668	39	4,934
Southwestern	90	1,712	1,047	10,377	12	2,515
Central	664	28,138	1,387	19,681	55	6,451
West	219	7,075	1,656	19,479	51	15,429
Pacific	264	4,908	1,172	9,269	41	1,428
Aggregate	3,226	$164,707	10,683	$120,054	302	$46,659

The banking failures in 1893 were 642 in number, with liabilities of $211,000,000, and reported assets of $234,350,000. The following table shows their territorial distribution:

States.	No.	Assets.	Liabilities.
New England	16	$9,852,895	$12,546,000
Middle States.	35	41,460,089	43,478,618
Southeastern	82	29,111,842	22,119,514
Southwestern	61	26,254,154	29,703,776
Central	149	38,766,378	37,457,963
Western	218	57,264,427	39,554,298
Pacific	81	31,634,752	26,138,639
Total	642	$234,345,537	$210,998,808

The railroads suffered in proportion almost more seriously than any other business interest. No less than 75 roads, many of them of the first importance, worth about one-seventh of the total mileage of the United States, were placed in the hands of receivers. Their total indebtedness reached over $1,200,000,000, the amount of stocks outstanding being $674,412,487.

The uniform shrinkage in prices of staples has been most marked. Cotton, which on January 1, 1893, was at 9¼¢, ruled on January 1, 1894, at 7 13/16¢ ℔ lb. Wool between the same dates shrunk from 28¢ @ 29¢ to 23¢ @ 23½¢ ℔ lb. Wheat fell from 79¾¢ to 65⅞¢ ℔ bushel; and corn from 49¼¢ to 42½¢, the latter prices being those quoted on the first business day of this year. As the prices of agricultural products virtually determine the prices of all other products, it is small wonder that those for all manufactured articles were the lowest on record. Yet with all these and other unfavorable effects of the financial panic of 1893, the wonder is that the business and commercial community of the United States in general passed through the fierce trials of the past year without yet more extensive disaster.

A comparison of the business done on the New York Stock Exchange during the year 1893 with that of 1892, shows as follows:

Stocks, shares	80,013,902	Dec..	5,613,084
Bank stocks	9,458	Dec..	2,698
Mining stocks	252,172	Dec..	63,294
Railroad bonds	$351,415,250	Dec..	$131,735,250
State bonds	3,766,400	Dec..	1,313,900
Government bonds	1,914,200	Inc...	292,000

Chicago Report.

Scrap.—Old Material is extremely dull. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	7.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—Business is very quiet and concessions are offered by dealers in the endeavor to move their stock, but the schedule of rates has not yet been formally changed. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

In the Omaha *Sunday World Herald* of December 17 appears a paragraph in regard to an alleged infringement of the patent of Merchant & Co.'s Star Ventilator. It would seem that the Star Ventilator was specified for the Lincoln, Neb., Hospital for the Insane and that the contractor, E. Gurske, placed other Ventilators in the building, which Merchant & Co. claimed to be infringements on their Star patents. Steps were accordingly taken to stop payment on the work pending an investigation. The matter was duly laid before the State Board of Public Lands and Buildings, with the result that the board decided to withhold a settlement with the contractor until he had made a satisfactory settlement with Merchant & Co. We are informed that Merchant & Co. have recovered heavy damages in the case.

The advertisement elsewhere of Hodge Brothers, 13 Chardon street, Boston, Mass., is addressed to the Stove, Furnace, Boiler and Household Goods trades, and calls attention to articles that will be appreciated by them.

CONDITION OF THE

Hardware Trade.

THE PAST WEEK, broken as it was by a holiday and devoted principally to the closing up of the business of 1893, was characterized by exceptional quietness in trade, and it is as yet too early to look for any important change from the conditions under which the old year ended. The results of stock taking are not yet sufficiently ascertained to indicate precisely the results of the business of the year, but it is assumed on general principles that profits will in most cases be considerably less than usual. It is presumed that the stocks on hand with the trade are considerably smaller than usual, and notwithstanding the relatively light business of the past few months manufacturers also have on hand somewhat less than the usual quantity of goods. The market is thus in condition to feel quickly the effect of an active demand when it sets in. Prices are in an unsatisfactory condition. Leading lines of staple goods are cheaper than ever before in the history of the trade, but in the line of general and Shelf Hardware prices which held six months or a year ago are still quite generally adhered to. There are indications, however, of a tendency toward lower prices in some goods, and it is not unlikely that a careful review of costs, diminished in some cases by reduction in wages, will enable manufacturers to name lower prices on some lines. The condition of the market in some of the leading trade centers is reflected in the communications given below from our special correspondents, some of whose advices, owing to special circumstances, are deferred until our next issue.

Advices from Chicago.—The Hardware trade has not yet made a start for the year. Salesmen are generally at home and stock taking has not concluded. Jobbers are not expecting any business of consequence for the first two weeks of the month.

Advices from St. Louis. — The jobbers of Hardware have about concluded their annual stock taking, and most of them are more than satisfied with the year just closed, when it is taken into consideration that many concerns throughout the country who started out so encouragingly have dropped by the wayside. The city of St. Louis was singularly free from business embarassments and the jobbers have not very many bad debts to carry over. Careful conservative judgment has been displayed during the entire year, and they now face 1894 with the hope that it will prove a banner year. Traveling men will shortly leave for their accustomed territory, and business in this department is expected to pick up quite lively during the next month.

Notes on Prices.

THE PAST YEAR witnessed a decided decline in the price of both Wire and Cut Nails, the decline having been most marked in the latter half of the year, especially the months of October, November and December, when exceedingly low prices were developed.

Wire Nails.—In view of the moderate demand and their indisposition to accumulate stocks several of the mills are largely curtailing their production or stopping for a time. The market, on the whole, continues in the unsatisfactory condition referred to in our last report, prices being represented by the quotation of $1.10 for carload lots at mill. It is, however, understood that this price can be slightly shaded on attractive orders, but manufacturers are indisposed to make concessions, and are desirous of reaching some understanding by which prices may be put on a more satisfactory basis. They are also unwilling to accept large orders for future delivery at current prices, and are at the present time pursuing a waiting policy and watching the market closely for developments. The Wire Nail market opened in January, 1893, weak and somewhat irregular, $1.40 being the price for round lots at mill. This price had declined by December to $1.10, some large orders being even placed at $1.05. It will thus be seen that the decline in price during the year was exceedingly marked, lower figures having been developed than had previously been thought possible.

Advices from Chicago.—Wire Nail manufacturers report but a small inquiry during the past week, but the market has been disturbed to some extent by offers of Nails at very low prices for spot cash by manufacturers desirous to realize on accumulated stock. It is probable that some large buyers have in this way been able to secure cheap Nails, but it is extremely doubtful whether any very considerable quantity was thus disposed of. Quotations are made in a general way at $1.15 to $1.20 Chicago for factory lots. Small lots are selling from stock at $1.30 to $1.35.

Cut Nails.—The Cut Nail market is characterized by stagnation, there being but little business. The quotation of 90 cents for carload lots at mill still represents the market, but this price could doubtless be shaded on good orders with attractive terms of payment. Small lots from store in New York are quoted at $1.20 to $1.25. The course of the Cut Nail market during the past year was similar to that of Wire Nails, having been characterized by an unprecedented decline in prices. The course of things is represented in the following quotations, which give the price of carload lots at mill at the close of each of the months named:

March	$1.20
April	1.15

May	1.10
June	1.05
July	1.05
August	1.05
September	1.00
October	1.00
November	.95
December	.90

Advices from Chicago. — Cut Steel Nails are extremely quiet. Merchants are slow about making contracts for such Nails as they will require during the early months of this year, but manufacturers believe that in the course of two or three weeks there will be considerable business. Prices on ordinary specifications are maintained at $1.20, but there is a tendency in the trade to make concessions on high averages. Small lots from stock are selling at $1.25.

Barb Wire.—The Barb Wire market is inactive and prices are low and somewhat uneven. Galvanized Four Point is readily obtainable at $2.05 at mill, with 5 cents off in carload lots. Painted, at mill, is represented by the quotation of $1.65, with 5 cents off in carloads. Some manufacturers are, however, unwilling to meet these prices. During the greater part of the past year the Barb Wire market was comparatively even in the matter of prices, but the last few months developed considerable weakness, and prices fell off to the comparatively low figure at which they closed in December. The course of the market is indicated in the following quotations, which give the prices for Galvanized Four-Point Barb Wire, in carload lots at mill, at the close of the months named:

January	$2.40
February	2.40
March	2.45
April	2.45
May	2.45
June	2.45
July	2.45
August	2.45
September	2.35
October	2.25
November	2.15
December	2.10

Advices from Chicago.—The local trade in Barb Wire seems to be quiet and confined to small lots, which manufacturers are supplying at $2.30 to $2.35 for Galvanized. The Indian Territory is the seat of severe competition for business, which is presumed to be assisted by cut freight rates to prevail for a limited time. Jobbers quote $2.40 on small lots of Galvanized from stock.

Cordage.—The Cordage market continues to show a declining tendency, and Manila has been sold in large lots at 7 cents, f.o.b. factory or New York, subject to the usual discount of 1½ per cent. for cash. Sisal and New Zealand are held pretty firmly at 5 cents for similar lots and terms.

Specialties.— A. S. Henn & Co., New Haven, Conn., issue the following discount sheet relating to their catalogue of light Hardware specialties. Terms, cash 30 days, with a discount of 2 per cent. for cash in 10 days:

	Discount, per cent.
Can Openers	50 and 10
Mincing Knives	50 and 10
Pocket Wrench	50 and 10
Soldering Set	50 and 10
Towel Holders	50 and 10
Bird Cage Springs	10
Picture Hooks	10
Door Numbers	50 and 10
Clothes Line Pulley	50 and 10
Brass and Bronze Bolts	60 and 5
Iron Bolts	70 and 10
Common Cast Bolts	70 and 10
Letter Boxes	50 and 10

The following are the list prices of their Sardine Knives, Can Openers, Mincing Knives and Pocket Wrenches, which are subject, as above stated, to a discount of 50 and 10 per cent., with an additional 2 per cent. for cash in 10 days:

Sardine Knives (Heavy Casting).

	Per gross.
No. 10, Japanned, bright steel blade, riveted	$7.22
No. 015, Japanned, bright steel blade, with screw	7.78
No. 15, Japanned, polished head, with screw	9.44
No. 3, Polished and nickel plated, with screw	13.88

Sardine Knives (Light Casting).

No. 010, Japanned, bright steel blade, riveted	5.56
No. 010, Japanned, bright steel blade, with screw	6.10
No. 010, Polished and nickel plated, with screw	11.68

National Can Opener.

No. 5, Japanned, steel blade, cast in.	4.98
No. 5, Japanned, polished head	7.75
No. 5, Polished, nickel plated	11.20

American Can Opener.

No. 0, Bronzed, with steel blade, cast in	3.88
No. 0, Polished, fine nickel plated, cast in	8.44

Henn Can Opener.

No. 60, Imitation ebony handle, nickel plated	33.32
No. 65, Enameled handle, polished	28.80

Sprague Can Opener.

No. 1, Japanned iron handle	14.00
No. 2, Enameled handle	15.00

Perfect Can Opener.

No. 30, Extra polished and nickel plated, cherry wood handle	36.00
No. 25, Polished, with japanned handle	24.00

Fifth Avenue Can Opener.

No. 20, Full polished and nickel plated	24.00
No. 22, Fine polished head, japanned handle	20.00

Grand Can Opener.

No. 50, Full polished and nickel plated	30 00
No. 55, Fine polished head and japanned handle	24.00

New American Sharp Pointed Steel Blade.

No. 02, Bronzed, extra hardened and tempered blade	5.00
No. 2, Silvered, extra hardened and tempered blade	6.12
No. 2, Polished and fine nickel plated.	8.90

Mincing Knives.

No. 50, Japanned handle, polished steel blade	18.88
No. 60, Silvered, unfinished	21.12
No. 70, Polished and nickel plated in full	36.68

Bicycle Pocket Wrench.

No. 200, Bright rolled Wrench, cast nut	18.88
No. 210, Fine polished, knurled steel nut	26.68
No. 220, Fine nickel plated, knurled steel nut	35.56

Malleable Iron Pocket Wrench.

No. 1, Fine tinned, brass nut	15.54
No. 1, Polished, nickel plated	22.22

Sap Spouts.—The Breck Sap Spout and Cover, manufactured by Joseph Breck & Sons, Boston, Mass., and illustrated in *The Metal Worker* December 30, 1893, is sold at the following net prices:

Sap Spouts, per 1000	$20.00½
Covers only, each	.06
" with indicators, each	.07
Special Bits, per dozen	2.25

Shot.—In sympathy with the raw material, a further reduction has been made in the prices of Shot. The revised prices, which are announced by the manufacturers under date January 2, are as follows, terms net cash 30 days, or 2 per cent. discount for cash in ten days:

Drop Shot up to B, 25-pound bag	$1.35
" " 5-pound "	.35
Buck Shot (including Bs, Ts and F), 25-pound bag	1.60
Buck Shot (including Bs, Ts and F), 5-pound bag	.40
Chilled Shot, 25-pound bag	1.60
" 5-pound "	.40
Dust Shot, 25-pound bag	2.00
" 5-pound "	.45

In lots of 2000 pounds and upward, taken at one time, a discount of 20 cents per 100 pounds and 2½ per cent. will be allowed.

Agate and Granite Iron Ware.—A revised price-list of Agate Iron Ware has been issued by Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, and a revised price-list of Granite Iron Ware by the St. Louis Stamping Company, St. Louis, Mo., and 96 Beekman street, New York. In both of these lists there has been a general revision and reduction of the list prices, and a change has also been made in the discount, which is now 25 per cent. instead of 33⅓ and 10 per cent. as heretofore. The net result is referred to as being a considerable reduction in the price of the goods.

Glass.—The Glass industry is waiting for developments and supplying the present demand. There is no particular attempt to anticipate the future, as the uncertainty of tariff legislation prevents any definite steps in the line of expansion. Favorable building weather in a large portion of the country creates a demand which it is understood is preventing any accumulation of stocks at factories. While no factories are reported as closing down, few additional ones are starting up, and an equivalent to 1118 pots are represented as now being in operation. As has been pointed out before, any change in tariff is not likely to take effect during this fire, up to July 1, 1894, but it will have a depressing effect upon prices if it is reduced. In some other lines related to the Hardware trade prices have been reduced in anticipation of lower tariff. Pittsburgh prices are given as 85 and 5 and 5 per cent. discount for single, and 85 and 10 and 5 per cent. discount for double strength Window Glass. Western factory quotations are reported as 85 and 7½ per cent. discount for single, and 85 and 10 and 10 to 85 and 15 per cent. discount on double strength Window Glass. The Plate Glass situation has improved to a limited extent, as some factories have orders and others anticipate starting. Prices show no improvement over those for the past few weeks and are reported as follows:

Large plate, 60 and 10 and 10 to 70 and 5 per cent. discount; small 70 and 5 to 70 and 15 per cent. discount.

Old Metals.—The market for Old Metals, including Scrap Iron, continues dull, due largely to the fact that consumers have not yet finished their stock taking and annual adjustment of accounts. Prices are somewhat irregular and incline to weakness. The following quotations represent about the prices paid in New York for moderate quantities:

Heavy Copper	℔ lb		7¢
Light and Tinned Copper	℔ lb		6½¢
Heavy Brass	℔ lb		5¢
Light Brass	℔ lb		4½¢
Lead	℔ lb		3¢
Tea Lead	℔ lb		2¾¢
Zinc	℔ lb		2½¢
No. 1 Pewter	℔ lb		14¢
No. 2 Pewter	℔ lb		6¢
Wrought Scrap Iron, ℔ gross ton		$7.00 @	$8.00
Heavy Cast Scrap, ℔ gross ton		8.00 @	9.00
Stove Plate Scrap, ℔ gross ton		4.00 @	5.00
Burnt Iron, ℔ gross ton		2.50 @	3.00

Old Rags, Paper, &c.—Business is very quiet in the market for Paper Stock. Prices remain at about the level of last week—viz.:

No. 1 White Rags	℔ lb	3¼ @	3⅓¢
No. 2 White Rags	℔ lb	2¼ @	2½¢
Mixed Rags	℔ lb		¾¢
Blues and 3ds	℔ lb	1 @	1¼¢
Hard Sized White Shavings	℔ lb	2¼ @	2½¢
No. 1 White Book Shavings	℔ lb	2 @	2⅛¢
No. 2 White Book Shavings	℔ lb	1 @	1⅛¢
Light Book Shavings	℔ lb		¾¢
No. 1 Mixed Shavings	℔ lb	¾ @	1 ¢
No. 2 Mixed Shavings	℔ lb	½ @	¾¢
No. 1 Printed Books	℔ lb	1 @	1¼¢
Ordinary Mixed Books	℔ lb	½ @	¾¢
Newspapers	℔ lb	½ @	3-5¢
No. 1 Manila Paper	℔ lb	1 @	1⅛¢
No. 2 Manila Paper	℔ lb	⅝ @	¾¢
Bogus Paper	℔ lb		½¢
Common Paper	℔ lb		⅜¢
Straw Chips	℔ lb		½¢
Binders' Clippings	℔ lb	½ @	⅝¢
Jute Butts	℔ lb	1⅞ @	2 ¢
No. 1 Jute Bagging	℔ lb	1 @	1¼¢
Mixed Bagging	℔ lb	¾ @	1 ¢
No. 2 Bagging	℔ lb	½ @	¾¢
Hemp Twine	℔ lb	2 @	2¼¢
Manila Rope	℔ lb	2¼ @	2½¢
Jute Rope	℔ lb	1½ @	1⅝¢
Mixed Rope	℔ lb	¾ @	⅞¢

Old Rubber.—The market for this material is a very narrow one, and values continue low. The following are about the prices given for Old Rubber delivered in New York:

Car Springs, ton lots, ℔ lb.		@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.		@	.03
Rubber shoes, less than carloads, ℔ lb	0.02¼	@	.03⅛
Large Hose, ℔ ton		@	9.00
White Wringer Rolls, ℔ lb.		@	.04¼
White Syringes, ℔ lb.		@	.05

Trade Notes.

E. L. PARKER & Co., 201 South Charles street, Baltimore, Md., favor us with a very pretty calendar that they are distributing to their friends in the trade. It is made up of six sheets bound together with a silken cord, each sheet carrying the calendar for two months. The printing is delicately done in blue ink and is but a feature of the sheets, the principal charm of which is their pretty decorations, which is particularly well printed in colors. The various scenes depicted on the cards are all devoted to bird life.

WE ARE INDEBTED to Bruce & Cook, 186 Water street, New York, for a copy of their calendar for the year 1894. They continue the style with which the trade have become familiar, which is a single large card with the calendar printed in double columns at each side of a center picture of the firm's warehouse. The border decoration is a fine design, printed in red and blue. This is the eighty-second greeting that Messrs. Bruce & Cook have offered the trade, the original firm beginning in 1812.

A SERVICEABLE CATALOGUE is issued by the John Dunlap Company, Pittsburgh, Pa. This firm manufacture an extensive line of Sheet Metal goods, and all the articles are illustrated and priced in the volume before us. Altogether there are 15 sections to the catalogue, which contains nearly 200 pages, the divisions being as follows: Deep Stamped Ware, Shallow Stamped Ware, Spoons, Forks and Cake Turners, Pieced Tin Ware, Japanned Ware, Stamped Tinners' Trimmings, Tinners' Miscellaneous Supplies, Enameled Ware, Galvanized Sheet Iron Ware, Sheet Iron Ware, Iron Goods, Wire Goods, Miscellaneous Goods, Tin Plate and Metals, Tinners' Machines and Tools.

THE NUBIAN IRON ENAMEL COMPANY, 8 to 10 Bonnell place, Cragin, Ill., are distributing desk calendars for the first quarter of 1894. These calendars have a daily memorandum sheet, and they are conveniently mounted on their own stand. The praises of Nubian are sung from day to day in a lively strain on each sheet, emanating from the fertile brain of Manager Bonnell. The invariable refrain is "the best black on earth."

WE HAVE RECEIVED from the St. Louis Stamping Company, St. Louis, Mo., their reduced price-list of Granite Ware. This catalogue, under date of January 1, 1894, illustrates and describes these goods, with descriptions, sizes, &c. Near the front of the book is a telegraphic code, and in the catalogue is a code word for every article made in Granite Iron Ware. The code word is placed immediately over the number or size of each article, and is designed for convenience and to save expense in telegraphing orders.

LALANCE & GROSJEAN MFG. COMPANY, 19 Cliff street, New York, favor us with their reduced price-list of Agate Iron Ware, dated January 1, 1894. The book contains 152 pages, with illustrations and list prices of the full line of these goods made by the firm. These are shown in a large number of styles and sizes, giving an almost endless variety from which to select. Among the new utensils offered to the trade attention may be called to the Agate Acme Coffee and Tea Pots with patent enameled wood handles, Agate Pit Bottom Royal Tea Kettles, Agate Round Handle Ice or Candy Scoops, Agate Pieced Cups, Agate Forged Basting Spoons and Agate Ice Cream Spoons. The catalogue contains an introduction detailing the special advantages of Agate Ware, together with a number of certificates and testimonials from chemical and medical authorities in regard to its hygienic character.

ANTHONY WAYNE MFG. COMPANY, Fort Wayne, Ind., makers of Washing Machines, &c., send us their new catalogue, in which illustrations are shown of the Wayne Combination Washer, Western Star Washer, Anthony Wayne No. 1 and Anthony Wayne No. 2 Washers, Wayne American Washer, Ironing Boards, Steel Clad and other Wringers, &c.

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Metal and Miscellaneous Prices.

CHICAGO, JANUARY 4, 1894.

Tin—
Straits pigs.....23¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 8.50
"	IC, 12 x 12	@ 8.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20.	$5.65 @$5.75
IC, 14x20, 90 ℔	@ 5.25
IC, 14x20, 100 ℔	.5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	.11.30 @11.50
X, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	...@ $5.82½
20 x 28	.....@ 11.25
IX. 20 x 28	.....@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20..	8.12½@ .....
IC, 20 x 28..	12.25 @ .....
IX, 14 x 20..	7.62½@ .....
20 x 28..	15.25 @ .....

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—	IC, 14 x 20	$7.00
" "	IX, 14 x 20	9.00
" "	IXX, 14 x 20	11.00
" "	IC, 20 x 28	14.00
" "	IX, 20 x 28	18.00
" "	IXX, 20 x 28	22 00
Florence.—	IC, 10 x 14, 12 x 12, 14 x 20..	6.75
	IX, 10 x 14, 12 x 12, 14 x 20..	8.50
Palma.—	IC, 10 x 14, 12 x 12, 14 x 20..	7.25
	IX, 10 x 14, 12 x 12, 14 x 20..	9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A: IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland: IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood: IC, 20 x 28	$12.00
Juno: IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method: IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie: IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resqured, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resqured, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resqured, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resqured, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resqured)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resqured)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resqured)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resqured)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—
Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 6-10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3-10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5-10¢
27	℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10¼¢; B, 9¼¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality..dis.70&7½@10%

Copper—
Ingot.

Lake.....12¢ @ 12½¢
Casting Brands.....11¢ @ 11¾¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu	...35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50

40 @ 45 %

Fancy Tubing, Brass, to No. 20 incl.....43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass.....

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 ℔ casks.....5
300 ℔ casks.....5¼¢
Loose sheets.....5½¢

Lead—
Soft Pig Lead.....3¾¢
Bar.....4½¢
Pipe.....5¾¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&½.....12¾¢@13½¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12¢ @12½¢
Hallett's.....11¼¢@11¾¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv.	50½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv.	57½&10%
Boiler Tubes, list Oct. 24, 1892	..65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	..50%

Cast-Iron Soil Pipe—
Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—
Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—
Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—
Cushman's.....$1.25 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*
Discount from list.....70%

Paints Oils, &c.—
Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ ℔, 2 ¢
" " Brown.....℔ ℔, 1½¢
" " Purple.....℔ ℔, 2½¢
" Ground in oil, B. Red ℔ ℔, 6½¢
" Ground in oil, Red..℔ ℔, 6½¢
" Ground in oil, Brown ℔ ℔, 5½¢
" Ground in oil, Purple ℔ ℔, 6 ¢
Linseed Oil, Boiled, in oils.....48¢
Linseed Oil, Raw, in bbls.....45¢
Mineral Paints.....2@4¢
Orange Mineral.....9¾¢
Pure White Lead in Oil.....6¾@7¼¢
Dry White Lead in bbls.....5¾@6¼¢
Red Lead, American.....6¼@7¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¼¢; kegs.....7¾¢
Sipe's Japan Oil, in bbls, ℔ gal.....84¢
Spirits Turpentine, in bbls., ℔ gal..35¼¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, JANUARY 5, 1894

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal (guaranteed over 94% pure Aluminum), in ton lots..... ℔, $0.70
No 1 (guaranteed to be 98 % pure and over), in ton lots.....℔ ℔ .75
Lots less than 1 ton, 10¢ ℔ ℔ additional.

Antimony—
Cookson.....℔ ℔, 10¾¢@11¢
Hallett's.....℔ ℔, 10¼¢@10½¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per ℔.	
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35	35@40%
Plain, to No. 20, above 3 inch	45	
Plain, 5-16 inch to No. 20	45	
Plain, ¼ inch	60	
Plain, 3-16 inch	1.00	
Plain, ⅛ inch	1.50	
Fancy Tubing to No. 20, inclu	43	

Copper and Bronze Tubing—
3¢ ℔ ℔ more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ ℔
Over 3½ to 5 inches inclusive.....18¢ ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ ℔
Over 3½ to 5 inches inclusive.....19¢ ℔ ℔

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%
See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished.....net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—
Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2.70	3 ¢
Nos. 17 to 20	℔ ℔. 2.80	3.10¢
Nos. 21 to 24	℔ ℔, 2.90	3.20¢
Nos. 25 and 26..	℔ ℔. 3	3.30¢
No. 27	℔ ℔. 3.10	3.40¢
No. 28	℔ ℔, 3.15	3.50¢
American B. B	℔ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11¾@12½¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ ℔, 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		70&5%@70 &10%
Nos. 17 to 22		
Nos. 23 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
Nos. 29 and 30		

Filter Joints—
Lee's.....33⅓%

Lead—
American Pig.....3¾¢@4¢
Bar.....4½¢
Pipe.....6¼¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3½¢ ℔ ℔.

Metal Exoanded—
Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2½

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, January 13, 1894.

DAVID WILLIAMS, - PUBLISHER

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Weathering the Storm.

It is a matter for congratulation that amid the financial storm and stress of the past year the members of the trades represented by *The Metal Worker* have on the whole enjoyed an exceptional immunity from the disasters which have brought low so many corporations and individual traders. The list of failures in the stove, metal, plumbing, roofing and heating trades compares very favorably with those in other lines of industry. Although the year 1893 was with most of our readers one of exceptionally bad business and the profit and loss accounts of too many will show a credit balance of very small proportions, if it does not, indeed, incline the other way, yet they have the satisfaction of knowing that they have weathered a storm which has submerged much stronger and more important concerns. One probable reason for this is that the trades referred to do not generally appeal to the luxuries, but to the necessities of existence. People must be warmed and housed and their sanitary requirements must be attended to, panic or no panic, and for these things they are willing to pay to the extent of their capabilities, while the mere extraneous luxuries are discarded. Yet the good record shown by these trades also reflects credit on the generally sound bases on which they are conducted, and the prudence and integrity which in the main characterize their members.

Electric Heating.

If electric heating ever comes into general use, of which there is at present no immediate prospect, notwithstanding in special applications it has been successful, the predictions of those who have enthusiastically portrayed its possible advantages over other systems may even in that case lack fulfillment. It is true that many of the exacting problems which now confront heating engineers in the use of warm air, hot water and steam as a vehicle for the transfer of heat will no longer need consideration, but analagous problems will be presented, and some new ones will be met with that perhaps will give as much trouble or more than the old ones; while many of the old ones will remain almost in their present form, being independent of the medium employed for conveyance of heat from a generator to any part of a building.

Ventilation as Related to Electric Heating.

No matter what system of heating may be employed the problems in ventilation which must be considered in connection with it will remain unaltered. For instance, an electric resistance coil may supplant the steam or hot water radiator now in use for indirect heating; but in any form the new appliance may assume the problem of getting the requisite quantity of air to and through it, and thence conveying the warm air into the space to be warmed and ventilated, will remain in all essentials what it is now, requiring the same special attention for each case, in order that all the conditions favoring or resisting flow of air for such particular case be taken into account and provided for. If the electric heating of buildings ever becomes a widely used system, the present problems relating to size, pitch and support of pipes in hot water and steam heating will not come in, but other and new problems related to the size of conductors and their safe employment will take their place, while the old ones concerned with amount of heating surface necessary for any building, and the proper distribution of the surface to secure desired effects, will not be materially altered.

Heating and Ventilating.

Heating and ventilating will, therefore, continue to be a special branch of engineering, just as they are at present. Electric engineering will be divided up into distinct branches, in the same way that steam engineering now is, and the same process of specializing that has separated marine engineering, locomotive engineering and steam heating from the design and manufacture of stationary steam engines, will inevitably differentiate the manufacture and erection of electrical appliances into separate departments. Only through such a separation can continued progress in the arts be expected, as is proved by the history of the last few decades.

Leakage of Air.

The porosity of walls and the vast amount of leakage around door and window frames are seldom appreciated by those who talk of stagnant air. Experiments with ordinary windows have made evident a leakage of eight cubic feet per minute while the passage of air through apparently tight walls has been frequently shown by experiment. In one instance a room supplied with hot air from an ordinary hot air furnace was tightly closed. The fire place was stopped up, windows were packed with rubber molding and the door shut. The wood work was shellaced and the brick work oiled. A measurement of the air volume entering showed that it was nearly equal to that when the doors were open. If the air entered it was obvious that it must escape somewhere. A second experiment was made after five coats of paint had been put on the walls and ceiling and three coats on the floor. Still the air entered through the register in large quantities, in fact its volume was only 20 per cent. less than in the former case. Such wholesale leakage readily explains the cause of low temperatures in exposed rooms on windy days, for the outside air pressure exceeds that within and the cold air actually leaks through the walls. Surprise is sometimes expressed that in many instances no vent flues are provided when the blower system is installed. This is particularly true of manufactories, offices and stores. Nevertheless, a volume of air sufficient to change the entire cubic contents once in 10 to 12 minutes is frequently supplied in such buildings and escapes only through walls and crevices.

The investigations of the United States Geological Survey in the South reveal the fact that large tracts of abandoned land in Misaissippi, Kentucky and Tennessee, which were formerly under a high state of cultivation, are being rapidly converted into deserts approximating to the "bad lands" of Montana and Dakota. Some of these regions aggregate from 4000 to 10,000 square miles in area, and are so far destroyed that it will take many years to restore them to fertility. Professor Shaler of the Survey urges the immediate planting of willows or other quick growing trees as the only check against further deterioration by preventing the washing away of the soil.

One proof of the falling off in foreign trade last year is shown in the fact that only 5024 vessels arrived at New York from foreign ports as against 5383 in 1892. Of the number arriving in 1893 1114 were American vessels, 304 of which were steamers. In 1892 1219 American craft were among the arrivals.

Destitution among negroes, which is so marked in many parts of the country, discloses the fact that, owing to the general distress, white men are this winter doing work that only negroes did a year ago.

Cost Keeping.

Notwithstanding its vital importance, the matter of accurately obtaining the cost of a manufactured product in detail, or of individual machines or parts of machines, frequently receives but meager attention. The annual balance, or, may be, deficit, is taken as a measure of the relation between the total cost and the selling price of the aggregate product, but just where money is lost and just where it is made is by no means so definitely known. Doubtless in almost every manufacturing business handling a variety of goods certain classes serve by their large profits to carry along the others, which could not stand by themselves.

Even such cost keeping systems as are in operation in some concerns are often so crude or general in their character as to preclude the possibility of obtaining accurate detailed information. Then, too, methods are sometimes incorrect or misleading. The foundry man who merely knows that the average cost of his completed castings is so much per pound is in no position to compete in prices on close estimates with the man who knows individually the cost of his iron in the ladle, and the average expense for snagging, pickling, ratiling, &c., so that he may thereto add his known or carefully estimated cost of molding.

Obviously the same holds to an even greater extent in machine manufacture, where the more detailed the information the more serviceable it becomes in determining where to cut in the cost or upon what figure to decide for a selling price.

The indefinite item of factory or establishment expense, covering fixed charges and to be added to the net cost of the article, frequently leads by its improper application to a distortion of the values. This can be avoided only in so far as the various items of this expense are charged directly to the article made, rather than lumped with others in a general percentage.

Nothing is more evident than that no one system of cost keeping is applicable to all classes of manufacture. The following general scheme appears, however, well fitted to the average establishment making a variety of articles of reasonable size :

In the first place, the hours of labor for which a man is to be paid and the time which he devotes to any given article or process are kept entirely separate. Time under the first heading is kept by any approved check or time clock system, and the pay roll made up therefrom. But the labor upon the specified piece is recorded upon a time slip, giving order number, hours worked, name of piece, character of work performed thereon, and number of tool employed to perform the work. This is signed by the workman, and as soon as the operation is completed passes to the foreman, who duly inspects and countersigns it.

At stated intervals, preferably every morning, these slips are collected, together with any orders, sketches, stock memoranda or the like relative to the same completed work. These records are all filed in a single envelope properly inscribed and numbered. There thus accumulates from day to day a complete record of the progress of the work, which may be consulted at any time. When all slips and orders are collected the filled envelope stands as a complete record of all written orders given, of the date of their fulfillment, of the total amount of stock used, and a detailed individual record of all work done.

In a piece work shop, piece work receipts properly signed by the inspector take the place of the time slips, but still continue to show the progress, and when checked up by piece work price-lists also determine the cost. Outside work upon installation, orders to the purchasing agent, corrections of orders and the like all go into the envelope with the rest.

The marked value of this system lies in the facts that no clerical work is required, unless the cost of the given article is to be figured, and that at any time, no matter how distant from the date of completion of the order, the full record may be taken from the files and the detailed cost determined. This is an important feature where goods are built to be sold at standard prices and costs require to be figured only at intervals.

This system in actual operation has shown itself readily adaptable to existing circumstances, elastic to a remarkable degree and free from the peculiar inconvenience of many book systems, where many pages must be scanned to obtain all the time chargeable to a given order.

Business in Canada.

A firm of hardware manufacturers and makers of heating apparatus, located in Canada, write to us in regard to the present condition of business in the Dominion and the outlook for the current year, as follows:

So far as can now be seen the prospects for general business throughout Canada are fair. The country generally is in a pretty sound condition. Some of the large cities and towns are suffering from real estate speculations, and also many of the active business men have lost severely by fall in stocks and wheat. The losses in this way for one city alone have been estimated as high as $10,000,000. Losses of this character are spread pretty generally throughout the community. This, however, does not necessarily affect general business, and probably but few houses have gone outside their legitimate business during the past year. We cannot say that our business has been injured directly by the financial stringency, but no doubt indirectly we have suffered, and we expect to feel the effects more during the coming spring should there not be a sudden reaction and a general improvement in business in the States. Although we have little direct intercourse with the States, it is impossible that we should not suffer by any depression which exists over there. We have at the present time a considerable amount of building work on hand, and there are several large buildings about to be put up here, but no new ones will likely be projected unless business improves generally. The demand for staple goods, upon the whole, is satisfactory, but prices are low, and the trade are very cautious, buying only in very small parcels on a "hand to mouth" basis.

The difficulties of doing business in Canada are very great, from the fact that our market is limited ; and it is not possible, except in very few instances, to carry on one special line of business. But the variety has to be increased in order to make the volume of trade sufficient to cover the expenses of large establishments. Houses doing a large business, embracing many lines, do so at comparative disadvantage. On the other hand, by having a variety, it is possible to save a little profit on some lines; while the leading lines may be cut even below cost. It is also a fact that we have to compete with surplus stocks from the States, which our tariff is not high enough to prevent being thrown on the market.

In the Good Old Days.

BY M K SULLIVAN.

How plainly I can see it, the shop of Silas Dean !
On the big open square, where the children used to play,
With its gray wooden shutters, and its door of faded green,
Which I used to bar and fasten at the close of the day.

There's the long wooden counter and its ledger for the day,
And the floor newly sprinkled and swept in groove and tongue ;
On the shelves, in the windows, from the ceiling, in array,
Gleam the kitchen's bright utensils for housewives old and young.

To no one branch restricted was the tinner bright of old,
A man of truest genius, he gloried in his craft ;
For he could pipe a furnace, or make a candle mold,
Set a pump, roof and "spout it," or figure from a draft.

There's the group of weekly peddlers getting ready for their trip,
With carts on Monday morning, all drawn up to refill,
With dish kettles, tea kettles, bread pans and drip,
Dippers, cups and muffin rings, to fill out the bill.

What odds and ends those peddlers brought in barter for our wares,
Bibles, books and pamphlets, songs of every hue and kind ;
Pewter mugs and candlesticks, iron tongs in pairs,
Metals, brass and copper, on their wagons strapped behind.

But times have changed since then, boys, and business methods too ;
And all that you can hear is nothing but machine ! machine !
It has spoiled the tinners' handicraft, their lable of true blue,
That the workmen used to wear in the days of Silas Dean.

The Department of Immigration reports that during the last fiscal year there arrived at our ports 440,793 immigrants. Of these, 1063 were not permitted to land under the limitations of the law, and 577 were returned to countries from whence they came by reason of their having become public charges. The total arrivals were 141,034 less than the previous year.

A friendly act of the French Government is the presentation to the State of New York of the major portion of its World's Fair educational exhibit, consisting of the work of pupils in the primary, secondary and normal schools of France, as well as a pedagogic library, containing text books used in the public schools, works of reference &c. The collection will be placed in the Capitol at Albany.

The London *Times*, in a review of British trade during 1893, says that the English carpet and shoe trades and the Birmingham screw making industry have felt the effects of American competition.

Chicago has a deficit of nearly $3,000,000 in the municipal treasury staring it in the face.

Annealing Sheet Iron.—I.

Past and Present Methods of Annealing Sheet Iron and Preparing it for the Market.

BY AMBROSE BEARD, CAMBRIDGE OHIO.

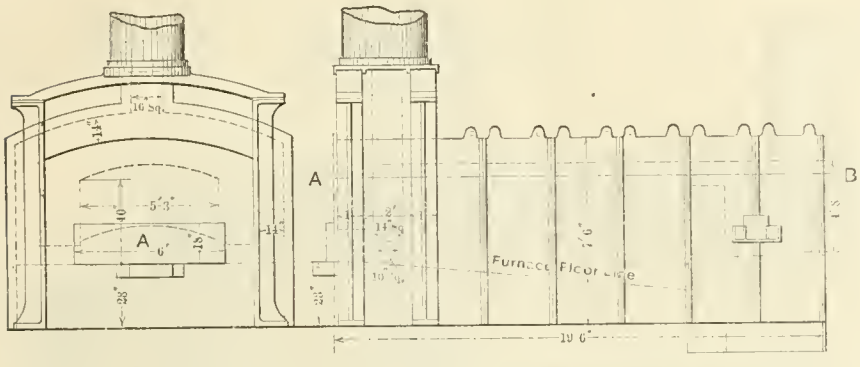
Supplementing, the articles which appeared recently in *The Metal Worker* under the caption of "Sheet Mill Progress," it is intended now to present a description, together with illustrations, of old and new methods of annealing sheet iron and preparing it for the market.

The old method of annealing sheet iron, which originated in England, had a few ardent adherents in the United States at a no later date than 1883, but finally it has been entirely dropped, except in annealing heavy gauge—*i. e.*, No. 18 and heavier. These gauges are still annealed in that manner unless otherwise ordered.

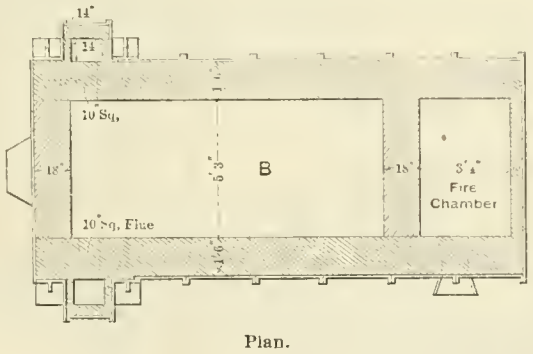
The old process was known as "open annealing" and with it followed a train of annoyances in the shape of scaled or burnt sheets that led progressive sheet mill men to adopt other means of annealing or softening and preparing their product for sale. The accepted method was known as "box annealing," and thus it came that the two kinds of sheet iron were on the market until early in the eighties.

Terms Used by the Trade.

The variety of terms applied to sheet iron in its progressive conditions toward perfection are always puzzling to a new buyer. He will see specifications reading "B. A." and ask for an explanation. One person will tell him it is "blue annealed," another "black annealed," and yet another "box annealed." As a matter of fact the terms are synonymous, and he will get the same quality no matter under which term he orders, the meaning of each being "box annealed," but, as will be hereafter explained, it does not follow that the sheets will be blue or black; they may be gray. Box annealed sheets should, however, under uniform treatment be all of a good dark blue color. To further explain the mystification of terms, "blue annealed" sheets, if of the heavier gauges—*i. e.*, No. 18 and heavier—may be "open annealed" and at the same time "blue." Yet strictly speaking the letters "O. A." should represent their quality. There are many other terms met with, such as "pickled;" "P. & C. R.," which means "pickled and cold rolled;" "C. R.," meaning "cold rolled." Continuing the variety such terms as "polished," "planished," "glanced," &c., will be met with, all of which represent higher degrees of finish, some equal to "Russia," but as these are manufactured under patents and the processes are justly the property of those who have spent time and energy to develop them the details are kept from the public. The qualities referred to in the subject under consideration are such as are made by the ordinary run of sheet mills.



End Elevation. Side Elevation.



Plan.

Fig. 1.—Old Style Open Annealing Furnace for Large Sheets.

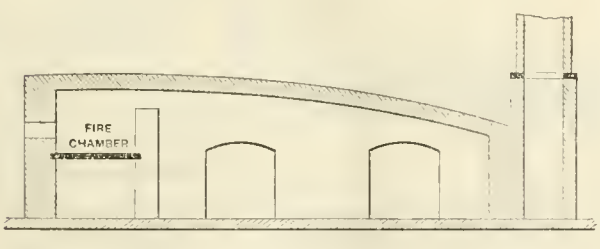


Fig. 2.—Section Old Style Annealing Furnace for Tin Plate.

The Uses of Sheet Iron.

When the fact is taken into consideration that a competent authority places the production of iron and steel sheets within the United States at about 400,000 tons per annum it is very natural to ask the question, "Where does it all go?" It would be difficult to answer this question off hand. The principal uses would soon come into mind—viz.: Galvanizing, for cornices, ornaments and a general line of building material. Next come black sheets for roofing, &c., followed by stove pipe. For the purposes mentioned probably two-thirds of the sheets rolled in a year are used. To find out what becomes of the remaining third we have only to call to mind the following:

Tin plate consumes a large quantity of black sheets and it is to be hoped that favorable circumstances will help keep up the increase. Then follows perforated sheet steel for use in milling machinery and many other purposes. Carpet tacks made from sheet steel, washers, ferrules, and a hundred and one small things. It is also used for manufacturing blowers, and their pipe connections, smoke stacks, house furnaces, engine jackets and parts of electric dynamos. Large quantities are consumed in making steel wheel barrows, kitchen sinks, frying pans, drip pans, stoves for burning oil or coal and a numerous variety of kitchen utensils. It is part of the construction of the millions of traveling trunks daily transported and is used for making buttons. Handsome sheet steel ceilings can be seen everywhere and plastering lath is made of the same material. Expanded metal in its variety of forms is all made from iron or steel sheets. It is hardly possible to look around without seeing this useful form of iron or steel worked into some serviceable shape and the list of articles into which it is manufactured might be continued *ad infinitum*. The continuous increase in the uses to which this material is put has caused growth of productive capacity to a point supposed by those competent to judge to be a little ahead of requirements. Buyers are more exacting and manufacturers have consequently been obliged to keep pace with the times by turning out sheets of unquestioned good quality and appearance in order to hold their trade. The annealing department is largely responsible for such results. Upon the supposition that the mill has furnished clean sheets, carefully rolled, free from scale marks or buckles, the rest depends upon the annealer and shipper. It is the purpose of this article to explain old and new methods in the finishing process.

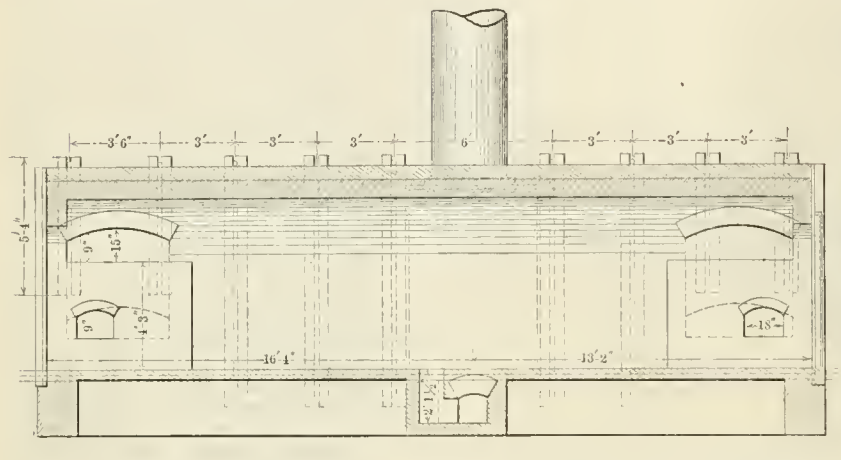
Old Style Annealing.

Fig. 1 represents an old style sheet iron annealing furnace. It is also a modern furnace for another use—viz., reheating packs of sheet iron for rolling into light gauges. Formerly it served two purposes, now it serves but one. In the early days of sheet iron rolling in America an extra furnace of this description was in every sheet mill to be used for annealing. In Great Britain this is not the case; there is not usually

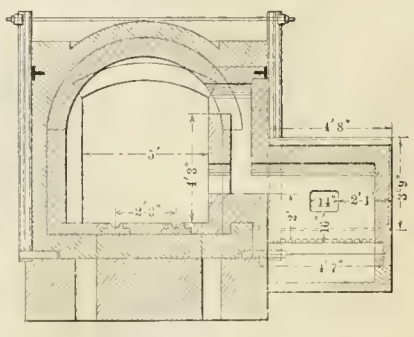
an extra furnace, and the heater and helpers have to arrange to do their softening as best they can. If the work gets ahead of them it is sometimes necessary to work so late on Saturday night to catch up that they do not get home until Sunday.

The work of open annealing is done in the following manner: The sheets are made up in bundles of six to 12 each, according to their weight, the object being to have the bundle and bands weigh from 140 to 150 pounds. An inside sheet — *i. e.*, one from the middle of the pack—is placed on the top, and next to it is a smooth sheet surface, is transferred to the top of the bundle, the bands are fastened and when cold the material is ready for the shipper or "stock taker," as that individual is called on the "other side." This process has two very objectionable features—it delays operations at the rolls and it produces sheets that are uneven in appearance. If the furnace is not working right there will be a red oxide on the sheets, in patches, and under the most favorable conditions scale will peel off the sheets whenever they are bent. English galvanizers quite frequently choose to do their own annealing in bar furnaces, as they sheets of high finish, but the general quality of iron and steel sheets such as are marketed every day in large quantities does not nearly approach the excellence of the American product. Such, at least, was the open expression of opinion made by British visitors to this country a few years ago. So long as they are not able to encroach upon the markets of the United States there is no reserve in giving them the benefit of valuable experience.

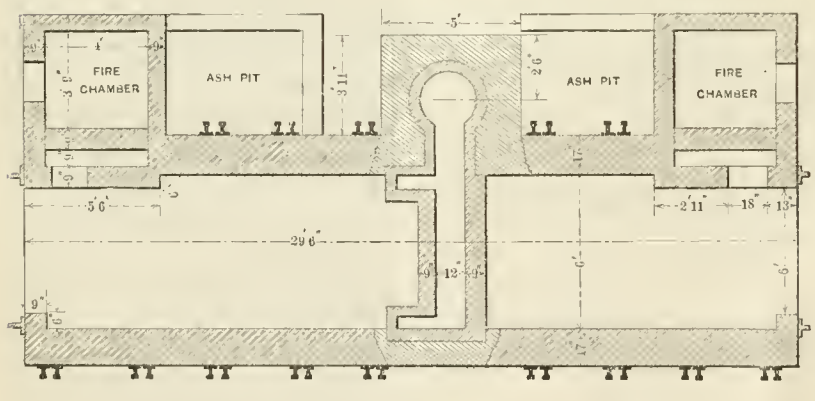
Fig. 2 is a sketch showing general design of an old style tin plate annealing furnace. The furnace is kept hot continuously, and when a box is "cooked"



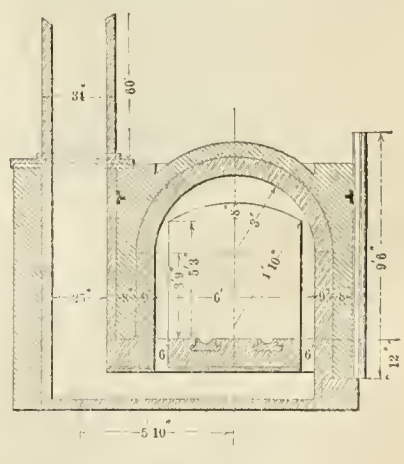
Section through Center of Furnace.



Section through Fire Chamber.



Plan.



Section through Smoke Stack.

Fig. 3.—Double Box Annealing Furnace No. 1.

having the gloss upon it produced by being next to the surface of the chilled roll when finished. These bundles are then placed in furnace B, being passed in through door A and turned up against the sides of the furnace until they become heated. They are then turned down and piled evenly upon each other on the floor of the furnace and are allowed to remain there until sufficiently soaked. During this time it is customary to cover the pile with waster sheets to protect the edges and surface of the good sheets from a rash flame. The bands with which the bundles are to be tied, usually ½ inch half oval, or ⅞ by No. 12, or a size known as "wagon box," are placed in the furnace alongside the bundles so as to make it easy to apply them. When the bundles are drawn, one at a time, from the furnace, the second sheet, which has the glossy find it more economical than paying for scale which is stripped from the sheet in pickling and is lost in the waste from the vat. They prefer to suffer the expense of box annealing and save weight in the body of the sheet. This custom, however, is not by any means general. During a British experience of several years the writer was frequently asked by sheet iron workers why it was that sheets were so scaly and often endeavored to interest manufacturers in adopting better annealing methods, but the invariable answer was that the consumer would pay no more for the better than the poorer quality. Be this as it may, it is proven in American practice that it is the cheaper method to box anneal. The reason for this is hereafter explained. It must be borne in mind by foreign readers of this article that the fact is not lost sight of that some English makers produce it is taken out by means of a very antiquated looking truck or carrier having a leverage of something like 15 feet, the carrying capacity being obtained by forks attached to the lever, which are placed under the bottom of the boxes. The axle acts as a fulcrum, a small army of workmen apply their weight and muscle to the lever and by main strength drag the bottom, the box and the contents, weighing altogether about 3000 pounds, from the inside of the furnace to the place for cooling. This device is also used in American tin mills, but some improvements have already been made in the method of handling boxes and others are being considered.

Box Annealing Furnaces.

For reasons previously mentioned and the additional reason that complaints from consumers were strong and numerous the old method of open annealing

was abandoned by many makers early in the history of the industry in this country. Some of them continued to cling to old traditions until forced to make a change, but the majority readily accepted the new process. The quality of sheets produced under the old plan of working was not satisfactory, and the work could only be done by skilled workmen. In box annealing common labor can be employed, and only one skilled workman is needed to superintend the operations, no matter on how large a scale they are conducted. Large quantities are annealed at one time, and the general expense is less, while a far superior product is obtained.

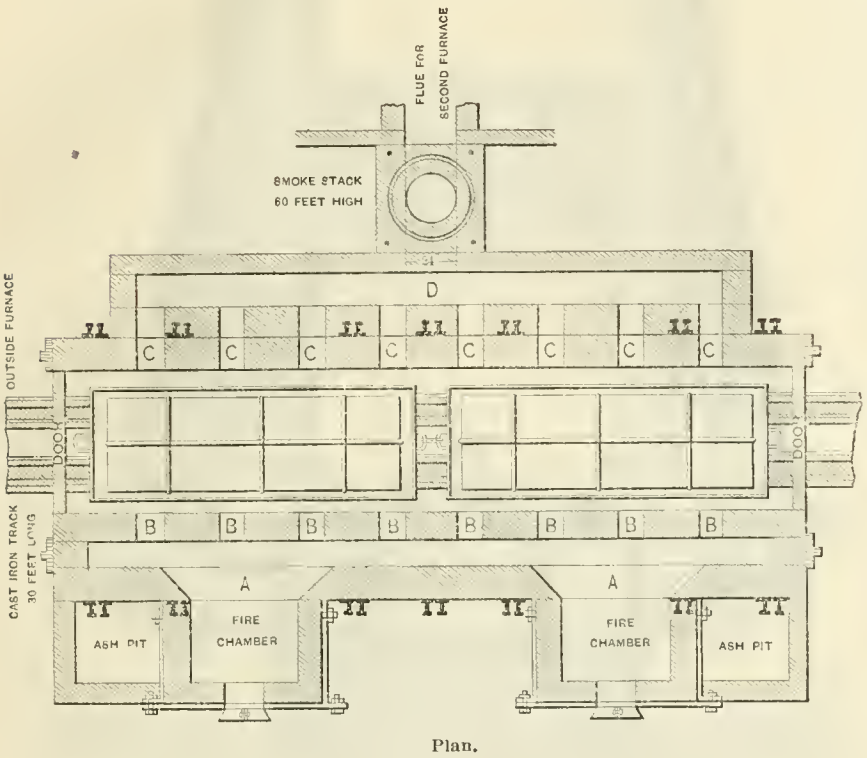


Fig. 4.—Double Box Annealing Furnace.—To be Built in Pairs and Operated by Only One Smoke Stack.

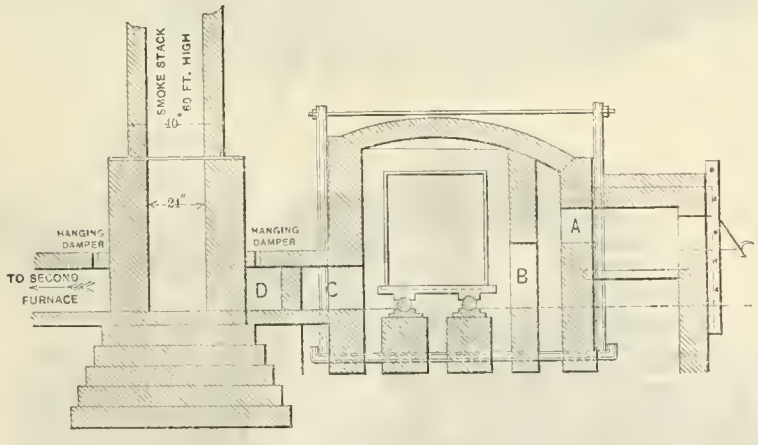


Fig. 4.—Section through Smoke Stack.

To illustrate the variety of improved methods in box annealing three drawings are shown. Fig. 3 represents a type of furnace that has been used successfully; the drawing is self explanatory and is accompanied by another design, Fig. 4. Each of these furnaces is what is known as a double annealing furnace; two boxes are drawn into the furnace together and with a slight increase in firing area over a single furnace, twice the amount of work is performed, a saving being effected not only in fuel, but also in labor.

The furnace represented in Fig. 4 is 30 feet long and 6 feet 6 inches wide inside. It will be noticed that there are two fire chambers. From these chambers the flame travels over ports A and is allowed to expand in the intervening space between that and ports B, where it strikes the annealing boxes at the bottom. The bulk of flame travels upward, following the arch of the furnace, and completely envelops the box; at the same time part of the heat travels under the carrier and thus a perfect distribution is effected. The flames pass out through the small ports C, and should it be found that heat is being concentrated in any part of the furnace in too great a degree, it can be regulated by placing fire brick in any of the ports C. Passing through these ports into flue D smoke escapes to the stack. At a point near the smoke stack a hanging damper is placed on a pulley to regulate the heat of the furnace. In the old style of box annealing furnaces the space between ports A and B is not allowed. Instead of this, the flame strikes the annealing boxes with its initial force before expansion and as a result boxes are badly burned and cracked when only a short time in use. It is justly claimed as a result of experience that nearly the very last unit of heat can be used in a furnace constructed in this manner. The additional room given for the expansion of the flame causes more gas to form and combustion is more perfect. In evidence of this it may be stated that smoke disappears in a few minutes after a new fire is put on. To make success more certain in operating a furnace of this design a steam jet should be introduced below the grate and the ash pit closed with tightly fitting doors, and the stoke hole should also be kept closed. An important point in favor of a furnace of this design is the arrangement for operating two furnaces with only one smoke stack. By adopting this plan a large space is left between the two furnaces, in which the crane used to hoist boxes is placed, and it also serves as a storage place for boxes not in use. If it is desired to place the furnaces in line with each other, the smoke stack may be placed between the two fire chambers as in Fig. 3 and connected by return flues, but these are always a source of trouble, as they become filled with dust and require constant cleansing.

Penny-in-the-Slot Electric Lights.

A correspondent of the Cardiff, Wales, *Western Mail* describes the new penny-in-the-slot electric lamps that have been recently fitted in the cars of the underground railway in London as follows: The penny-in-the-slot electric lamps have come into use on the London underground railways this week. Trusting to memory, I will say it is two years since the first experimental lamps were put on a few trains and described by me. Since then arrangements have been made to fit the lamps to all the trains and the work is now complete. There are four lamps in each compartment. If you want to read, and the ordinary light is insufficient (that is a dead certainty), you put a penny in the slot and obtain an electric light which lasts you half an hour. If you want more you have to put in another penny. The lamps are conveniently placed at the back of the seat so as to throw the light on the book or paper. They were in immense demand at the outset. Every one wanted a pennyworth of electric light, and I believe the people used the trains on purpose to try the lamps.

Mexico is about to undertake an important irrigating enterprise, which will, when completed, afford water for some 500,000 acres of good cotton land. Works are to be commenced, consisting of a dam 6 miles about the junction of the San Juan and Rio Grande rivers and some 100 miles of canal and laterals.

The fishing industry appears to have been happily exempt from the general depression of last year. The annual report from Gloucester, Mass., speaks of a prosperous fishing season in 1893, with the catch of that section estimated in value at $9,000,000, and receipts approaching those of 1892, which was an exceptionally good year. Fortunately financial stringency does not repel from our coasts the finny denizens of the deep.

Drop Press and Drop Lifter.

The six-poppet drop press made by the Miner & Peck Mfg. Company of New Haven, Conn., is intended for use in stamping metal ceiling plates, metal shingles, and all work requiring square dies. This machine is made in several sizes, that illustrated in Fig. 1 being of sufficient size to take in a die 27 inches square. The method here shown of holding the square die is believed to be preferable to that of four poppets holding at the corners. The hammer is arranged to hold the soft metal by four bolts with projecting heads.

The poppets are fitted by the Peck improved process, are finished all over, and in such a manner that the screws have a perfect range. The holes for the poppets are bored out and poppets fitted to them and securely and accurately held. The bolts for holding the guide rods are very large and have long nuts carefully fitted to insure them against coming loose, while under the heads of the nuts are large iron plates to relieve the guide rods from jar and its injurious effects.

These drops are arranged to be worked, if desired, by hand or foot power over a flanged pulley; but the manufacturers recommend that they be used with the Peck automatic lifter, shown in Fig. 2, for the reason that with this attachment much more, and more uniform, work can be produced than by foot or hand, and with less fatigue to the operator.

The frame of this lifter is of new design and is much heavier than the earlier forms. The length of the bearings has been increased, and on the main shaft, instead of making back bearing smaller, as in the former pattern, it is continued through of the same size as the crank bearing. Instead of having collars on the shaft at the bearings, the hubs of the lift and the dog cranks are made to act as collars, thus leaving the shaft of one size its entire length, with no shoulders to weaken it.

The strength of the gear and pinion has also been increased. The pillow blocks on the back of the shaft are bushed, these bushings being of uniform size, so that new ones can be inserted when the others become worn. In the place of cup screws, tapped into the frame to hold the main bearing caps, bolts are passed through the frame and held with check nuts. In the larger sizes the makers prefer not to have the sockets divided and with rubber springs inserted in the flanges, but to insert a rubber cylinder in the cavity in the hammer under the lifter belt. This arrangement has the advantage of allowing the pinion on the back shaft to be placed in the center of the back shaft, instead of at the end next to the bearing; and, thus arranged, should any extra strain accidentally come on the pinion, the shaft will spring and relieve the frame, whereas if the pinion is close to the frame an extra strain, such as the breaking of a tooth of the gear or the pinion, would be liable to break the frame. The crank illustrated is provided with fine adjustment, designed for silver and other fine work, and enables the blow to be changed in length by half inches. This form of crank is placed on lifters only when specially ordered. The shafts are made of hammered crucible steel; cranks, ratchet and dog of forged steel, and all the other parts of carefully selected materials. These machines are now in successful operation in the stamping works of Lyles & Mills, 231 William street, New York.

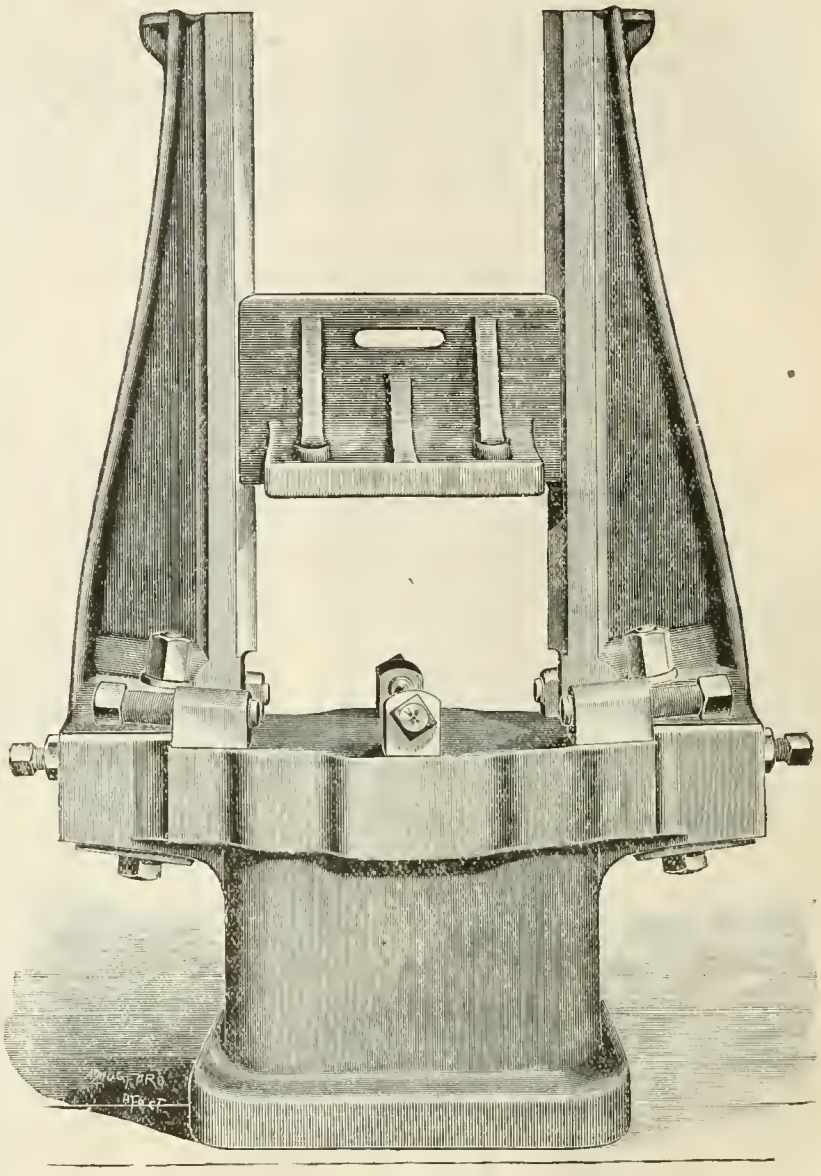


Fig. 1.

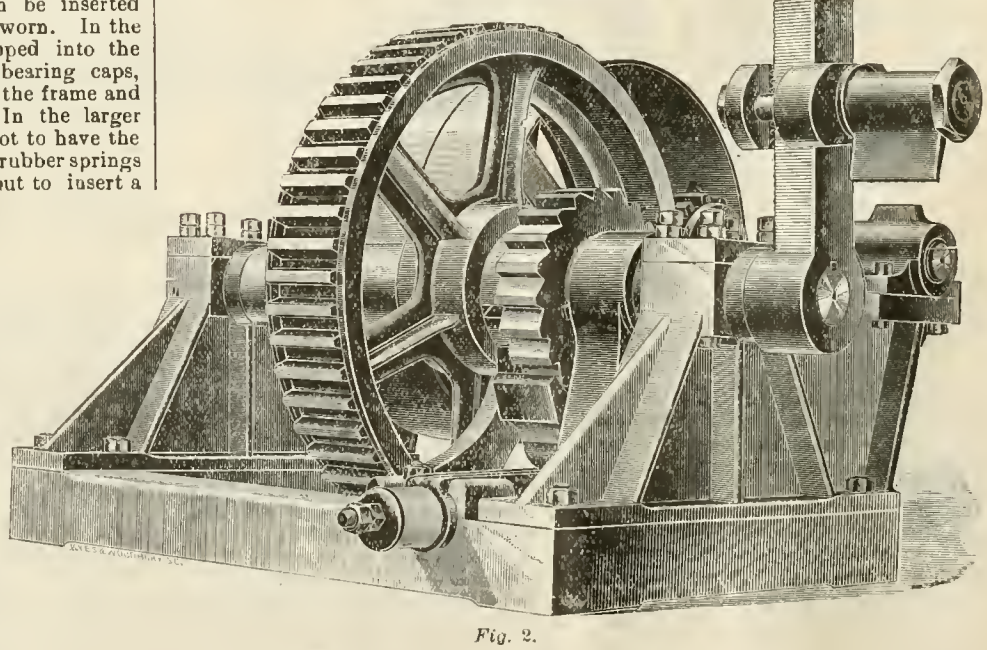


Fig. 2.

THE MINER & PECK DROP LIFTER.

THE LETTER BOX.

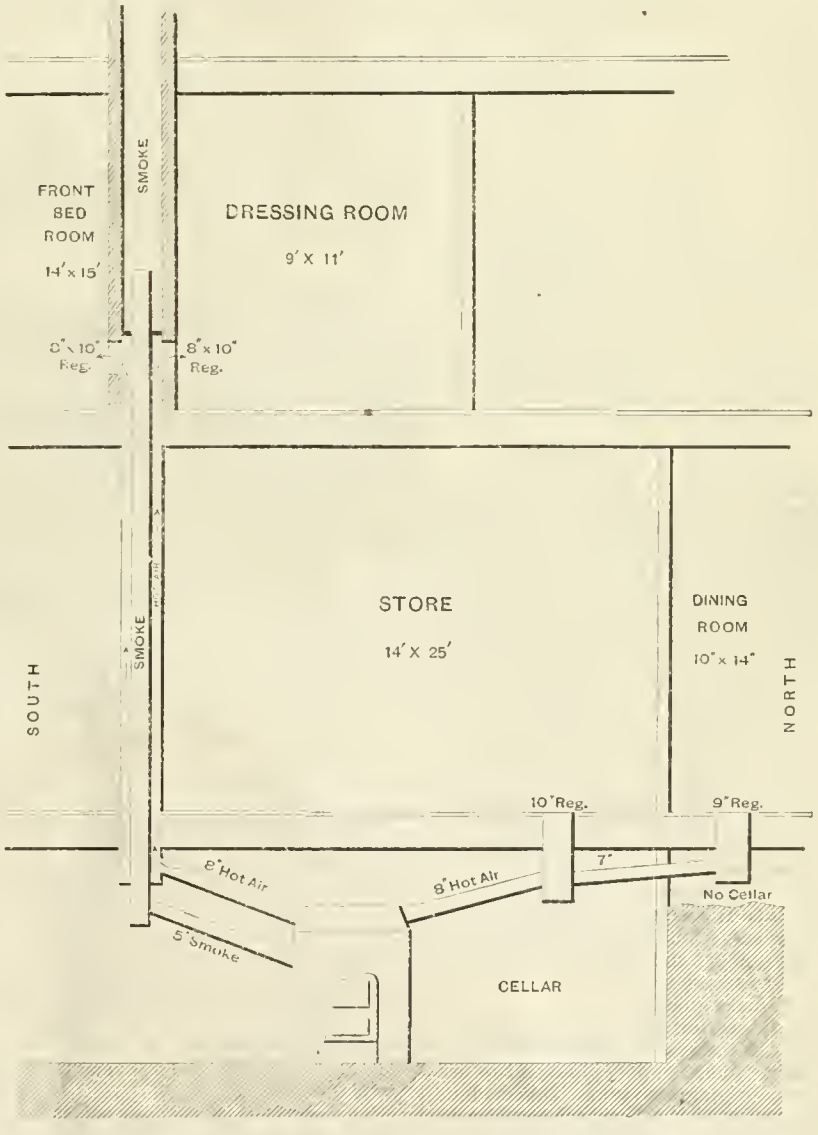
Trouble With Electric Bell.

From R. P., *Huntsville, Texas.*—I am in trouble with electric bells, one single stroke and the other vibrating. The difficulty is that I cannot get a blow hard enough. The vibrating is not as strong as the other. I have eight cells of dry battery and the hammers are on No. 14 brass wires. The size of the magnets is 1 inch in diameter by 1⅝ inches long. The core of the magnets is $\frac{7}{16}$-inch in diameter. Do you think the magnets too small, and if so, how can I make them stronger? I want to know if in Fig. 5 in *The Metal Worker* of December 2, page 34, the small spring shown just below the one marked E that strikes the contact screw is of much use. The spring seems to be of no use in the vibrating bell, as it lies flat. On the single stroke bell there is no spring. I have had these bells worked on three times at an electrical establishment where they were made, but with no good result—simply a loss of time and money.

Answer.—We assume from our correspondent's letter that his bells are connected in series, and that the whole current passes through each bell. Eight cells of battery are entirely too much and are liable to burn out the contact points on the bells. The resistance of the magnets should be about the same on each bell to have them work properly—in other words, there should be the same size and amount of wire in the coils of each bell. The size of his magnets appears to be right, provided they are properly constructed. The small contact spring should be substantially the shape shown in the cut, as referred to. Both bells should have these springs, as they not only admit of a more delicate adjustment, but also prevent the adjustment being deranged by the hammer-like blows of the armature on the screw. Four cells of battery, if in good condition, should furnish an abundance of power to operate these bells. Never connect batteries of different makes together. Take four of the cells and test them. If our correspondent has no galvanometer this can be done with an ordinary electric bell. Connect it by means of short wires to the battery. If it rings sharply the battery is all right; if it does not, test each bell separately in the same manner, to discover which one is to blame, as one weak bell in a battery of 50 would destroy its working power. If the battery proves all right, close the circuit and try the adjustive screw on the vibrating bell. Turn it back until the magnet will scarcely attract the armature, then reverse and turn the screw up slowly, and when the proper adjustment is reached the bells should ring clear and regular. If this does not remedy the trouble, test the bells separately. If all else fails, try connecting the battery in multiple arc—that is, connect all the negative elements with one wire and all the positive with the other. The bells may be wound for a quantity current rather than intensity.

How a Furnace Job Was Managed.

From A. S. R., *Philadelphia.*—A short time since I was called upon to put a heater in a house which had but one flue, and that stopped at the second floor. It was necessary to heat the store and dining room on the first floor and the front bedroom and dressing room on the second floor. The cellar was so arranged that the heater had to be set about 10 feet from the front of the building, which faces the south, the back of the heater being against the west wall. The cellar being very shallow it was necessary to cut the heater down to get an elevation, but I could not get enough to run a pipe from the heater direct to the dining room. To continue the flue to the cellar I used an 8-inch pipe, which was inserted in the bottom of the flue. I then connected this with the hot air pipe from the heater, which was also 8-inch, with a T joint, leaving a 5-inch hole in the head at the bottom. I then ran a 5-inch pipe inside of the 8-inch pipe above the cut off above the register on the second floor. This gave me a chimney and hot air flue, which heats the front bedroom and dressing room. I then made a register box from a joint of 10-inch pipe, placing a 10-inch floor register near the east wall of the building. I ran an 8-inch pipe from the heater to register, continuing from the same box with a 7-inch pipe to the dining room, connecting it with a 9-inch floor register. There is no cellar under the dining room. The inclosed sketch will show how the pipes were run. This may be of some use to a brother tinker, or perhaps a better plan could be suggested.



How a Furnace Job was Managed.

STEAM AND HOT WATER.

Piping for Water Warming.

BY KNIGHT.

The piping in a warming apparatus, forming as it does the connecting link between the boiler and the radiator, performs a duty important in itself and easily includes in its proper erection the success or failure of the apparatus. The pipes in a warming apparatus stand in the same relation to the boiler and radiators as is occupied in a power plant by the main connecting the boiler with the cylinder of the engine.

The heat generated by the combustion of the fuel on the grate is absorbed through the fire surface into the water and is conveyed through the pipes to the radiator or to the engine cylinder, where in the radiator it makes its appearance as sensible heat and in the cylinder as motion. In either case the piping represents the means of conveyance of the power represented by the heat to the point at which it is to be applied. That this heat, representing a certain amount of power, be transmitted with the greatest ease and with the least loss, is for the interest of the owner of either the warming apparatus or the power plant. To secure this transmission to the best advantage it is necessary to give the most careful attention to the details incident to the erection of the piping.

Principles of Circulation.

To put in the piping in the average warming apparatus correctly is not an especially difficult feature of the work, but it is one to which it is well to give careful attention, both as to the minute details and general features. In a water warming apparatus the idea to be kept in mind in the erection of the pipe is the law governing the circulation of water, the rise of the warmer column of less density from the boiler to the radiating surface and the return of the cooler column of increased density to the boiler, through the return pipes, the velocity being in proportion to the difference in temperature and the vertical hight of the radiating surfaces above the absorbing surfaces. To arrange the piping to secure the best results it is necessary to so plan it as to secure an even circulation of the whole apparatus as a unit without making an effort to secure special results from the individual radiators.

In the earlier days of water heating it was the Canadian practice to run a separate line of supply pipes and return pipes for each radiator. This had its advantages in allowing each radiator to do its work independently of the remainder of the apparatus. Its disadvantages were the extra expense of running so many different lines and having so much unnecessary material in the cellar. As attempts were made to include larger work within the scope of the water circulation it was found that pipes could be run with exactly the same freedom that could be employed in steam warming, and further familiarity with the application of the principles of water circulation has led to the many different forms and methods of piping which are now prevalent among the trade.

Obstacles to Circulation.

The two practical obstacles opposing circulation are either of the nature of a burr or some obstruction in the pipe or air pockets, both of which can be avoided by the exercise of a little care and attention. The other causes tending to restrain the movement of the water in circulation are the friction in the pipe and the loss of head, due to a change in direction of the flow of the circulating column, the short radius of curvature of elbows and fittings used in the work making this last loss quite considerable. The loss due to friction cannot be avoided. The loss due to the use of elbows can be overcome only by employing fittings whose radius of curvature is approximately five times their internal diameter. It is well to employ in water work the fittings which are now manufactured specially for this purpose and which come much nearer realizing the theoretical conditions than the old style fittings.

The amount of loss due to friction and change of direction under any given conditions can be very accurately estimated, but in the writer's opinion such calculations would seldom be made for work of no more importance than the average warming apparatus. An accurate knowledge of these principles might prove of advantage to the average fitter, but it is to be doubted if the application of them would aid him materially in proportioning the piping in any system for house warming. We make a decided recognition of the effect of these causes in every day work, when we allow a size larger of pipe for a horizontal run than we would employ for the vertical rise, and in allowing extra sizes of pipe to help out the circulation when the conditions to be met are such as need the extra encouragement.

Size of Mains.

In water work, as the return water is to all intents and purposes of the same bulk as the supply water, the same provision must be made for its return as for flowing it—*i. e.*, the return pipes must be of the same size and present the same working area as the supplies. It is generally admitted as a good rule that a square inch of pipe area will flow enough water at an average temperature to supply 75 to 100 feet of radiation, working under average conditions.

This can be done without necessitating an undue velocity of the water, and this fact is applied in the evolution of a thumb rule for the calculation of the size of mains for supplying any given amount of radiation. This rule is a good one, very simple, and can be applied to low pressure steam as well as water. A statement of it is as follows: To find the capacity of a pipe in square feet of radiation supplied square the nominal diameter of the pipe and multiply by 100. Or, to work from the other end, to find the size of pipe necessary to carry any given amount of radiation, divide the number of square feet of radiation by 100 and extract the square root, this giving the nominal size of the pipe. This rule is an old one, but nevertheless is a good one and easily remembered.

An inspection and application of the above rule will show that it does not conform exactly to the statement made before that 1 square inch of pipe area would supply 100 feet, but it is near enough to show that the rule is good guessing and its practicability has been demonstrated by long continued use. Of course, the larger the pipe employed the wider the range of capacity that may be assigned to it.

Size of Branches.

In determining the size of the radiator connections and smaller branches, no one rule can be made to cover all cases. Each radiator manufacturer has a certain standard for water which meets the requirements of average work, and the fitter must govern himself in each instance by the particular conditions to be met.

Of late there seems to have been a movement among the heating fraternity toward the use of small pipes for water circulation, the argument being that the water circulates as well, and that they can be put in at less cost. As a matter of personal opinion, the writer is strongly in favor of using pipe of ample size, preferring the larger to the smaller size, in case any necessity for choice should arise. Every radiator, to maintain a given temperature in a room, requires the flow to it of a certain amount of water. This water can be supplied to it through a pipe of small diameter or of large diameter, within practical limits. The condition to be observed is the velocity with which this amount of water must be delivered to meet the requirements of the radiator. If the pipe is small, then the velocity must be so much the greater; the greater the velocity, the more loss of heat due to friction, the more friction to be overcome, the more boiler power required and the more heat from the coal lost in doing unnecessary work, and finally more liability of unsatisfactory results from poor circulation.

If one is disposed to consider the question minutely, it can be calculated exactly how much water at a certain temperature would be required by a radiator of a given size, working under given conditions, and, knowing this it is not difficult, with a given velocity of the circulating water, to calculate the necessary area of supply pipe. However, it is the writer's opinion, as expressed above, that it is to be doubted if such calculations would prove of material worth in the erection of house work of the average size.

If small pipe is to be employed, make the lines as short as possible and, in case of a question between two sizes of pipe to be used, the weight of argument is generally in favor of the larger size. A good idea, however, to be followed in this is to make the mains of ample size and get the water within a reasonable proximity to the radiators in pipe of good capacity, and

then it will make but comparatively little difference as to the size of the final connection.

HEATING NOTES.

TRAHEY & MCCASLIN of Zanesville, Ohio, have purchased the machine shop and plumbing business of H. A. Morrow, at Cambridge, Ohio. The new firm will do general machine and repair work, and make a specialty of steam and gas fitting.

THE RAYMOND & CAMPBELL MFG. COMPANY, Middletown, Pa., issue a striking calendar for the current year. The calendar proper is a small pad of 12 sheets fastened to the lower corner of a very handsomely colored poster, representing a beauty of the Egyptian type, arrayed in gorgeous colors and carrying a huge ostrich feather fan across her shoulders. In addition to directing attention to this Eastern type of beauty the calendar also brings to notice the Lindemuth Steel Sun steam and hot water boilers made by this firm. The same firm also call attention in circulars to the fact that they have withdrawn their former price-list and issued a new one under date of January 1.

S. T. WILLIAMS, specialist in hot water and steam heating, has severed his connection with Pierce, Butler & Pierce and George B. Cobb & Co., and has accepted the management of the New York department of the Model Heating Company, at 305 Pearl street.

WE ARE INDEBTED to Secretary Reynolds for the report of the fifth annual convention of the Master Steam and Hot Water Fitters' Association of the United States, which is an unusually attractive volume. The volume is bound in tinted card covers, held together by a silk cord, and contains the official proceedings of the convention. An attractive feature of the publication is the bird's-eye view on the front cover of the World's Fair grounds. The portrait that introduces the proceedings is an excellent likeness of Mr. Rutzler, the president of the association.

The citizens of Marlborough, N. Y., recently witnessed a test of a new waterworks system just completed for the Water Works Company by Charles Millar & Son of Utica, N. Y., assisted by John Marsden as engineer. Henry W. Millar and John L. Murray of this firm are respectively vice-president of the water company and secretary of the Utica Pipe Foundry Company, which furnished the pipes. On attaching a hose to a hydrant water was thrown to a hight of 125 feet, and ample pressure shown to reach a fire in any of the buildings of the town. Water is brought 2½ miles from a reservoir having a capacity of 3,500,000 gallons, and which is fed by a series of springs. About 33,000 feet of 4, 6, 8 and 10 inch pipe and 45 hydrants are used in the system. The valves and hydrants were made by the Eddy Valve Company, Waterford, N. Y. The works are estimated to have cost $52,000. The company has a capital stock of $26,000, and is bonded for $26,000 at 5 per cent., all of the bonds being held by Henry W. Millar, John L. Millar, John Marsden and J. S. Bowes.

Chicago's city jail is said to contain 52 prisoners awaiting trial on charges of murder.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

TURNBULL & POSTLE Chicago, Ill., have completed plans for converting the Champlain Hotel, on Sixty-sixth street and Champlain avenue, into an apartment building for H. R. Brook. It will have steam heat, new partitions and other improvements are to be made, at a cost of $6000.

CHARLES A. HILL, Milford, Mass., has a $2000 contract for the plumbing in George A. Draper's new residence at Hopedale.

THE CONTRACT for plumbing in the High School building at S. Milwaukee, Wis., was secured by Loftus & Stallberg.

A STEAM HEATING APPARATUS has been placed in the Hanover engine house by S. A. & W. S. Flickinger of Hanover, Pa. The apparatus not only heats the entire building, but also keeps the water in the boiler of the engine at a steaming point.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until January 30, for the work, including the plumbing, for the United States Court House and Post Office at Danville, Ill. Drawings and specifications can be obtained from the Supervising Architect, at Washington, or at the office of the superintendent, at Danville.

THE CONTRACT for heating the new brown stone residence of Samuel L. Reynolds, at Lancaster, Pa., has been secured by Flinn & Brenneman, assisted by E. E. Palmer, representing the J. F. Pease Furnace Company, Syracuse, N. Y. A No. 320 Economy Special low down steam and air heater will be used. The radiation will be principally of the Excelsior indirect style.

E. K. BARR of 1020 Betz Building, Philadelphia, representing the Herendeen Mfg. Company of Geneva, N. Y., states that the Faultless Furman boilers are specified on the schedule for 1894 for the Department of Public Safety in Philadelphia for use in patrol houses, police stations, fire houses and other buildings.

THE KELLY & JONES COMPANY, 48-52 North Clinton street, Chicago, have completed the steam heating plant in the Lakeside Club Building, Grand Boulevard and Forty-second street; also in the Chicago Athletic Association Building, Washington and Madison streets.

THE J. L. MOTT IRON WORKS, 311 and 313 Wabash avenue, Chicago, are furnishing about $15,000 worth of plumbing fixtures for the new Union Depot at St. Louis. Fred. Abel & Co., St. Louis, do the plumbing.

THE BAKER & SMITH COMPANY, 193 to 197 Van Buren street, Chicago, have contracted to deliver a Gorton steam boiler and connections to the Pine Ridge Indian agency, Pine Ridge, S. Dak.

THE L. H. PRENTICE COMPANY, 203 and 205 Van Buren street, Chicago, are to furnish a low pressure steam heating plant for the three double flat buildings of D. F. Crilly, Eugenie street.

THE SMITH & ANTHONY STOVE COMPANY, 217 Lake street, Chicago, have contracted to place a No. 30 "Hub" hot water heater in the residence of G. F. Featherstone, West Monroe street and St. Louis avenue.

PECK BROS & CO., 259 Wabash avenue, Chicago, furnished the plumbing fixtures used in the Criminal Court Building. They are also to supply the plumbing fixtures for a new hotel at Hot Springs, Ark., and for the residence of G. E. Orde, Glencoe, Ill.

THE SMITH & ANTHONY STOVE COMPANY, 217 Lake street, Chicago, have received an extra order for 200 Sanitas traps, to be used in completing the plumbing in the extension to the Monadnock Block, Dearborn and Van Buren streets.

THE WALCOTT-HURLBUT COMPANY, 175 and 177 Lake street, Chicago, have received a letter from James A. Arthur, treasurer of the Goshen, Ind., School Board, who speaks in the highest terms regarding the operation of two Eduction Syphon Closet Ranges placed in a school building.

THE LOGAN MACHINE WORKS of Bellefonte, Pa., have just completed the heating system for the new hotel at the State College, embracing twin low pressure boilers conveying the steam to 71 radiators on the different floors. This firm have also just completed two large jobs in Mifflin County and are now placing the apparatus to heat the Presbyterian church at Lewistown.

Dinner to Trade School Instructors.

Last Saturday evening R. Fulton Cutting entertained the instructors of the New York Trade School at his residence, at 724 Fifth avenue, New York. He was assisted by A. H. Mackey, the newly elected member of the board of trustees and three other members of the board, F. Augustus Schermerhorn, J. Pierrepont Morgan, Jr., and Wm. E. Dodge. The plumbing instructors were, Superintendent John Delehanty, John MacMenamy, T. B. Walmsley, R. A. Clarke and three new instructors, George B. Wooda, James J. Lynch and Thomas Kelly, whose assistance is required owing to the unusually large day class this year. The painting instructors were: John B. McGowan, H. Bornhagen, E. A. Kennedy and George Bunce; blacksmithing, F. W. Genicke; stone cutting, James Hughes, Sr., and James Hughes, Jr.; masonry, E. Van Houten, Frank F. Van Houten, D. J. Ahern and Thomas Carey; Carpentry, D. Vanderbeek, James D. Edwards and W. H. Lockman; Printing, Morris Van Vliet and J. M. Unangst. Harry Brill, J. H. Brill and J. Stanly Thomas were also among the guests. Mr. Cutting made an address after the dinner, and was followed by Mr. Dodge. Responses from the guests were made by Mr. Delehanty and Mr. Kennedy, when the end came to a very pleasant assembly.

THE MCDANIEL & HARVEY COMPANY of Philadelphia, Sheet Iron manufacturers, have recently made some important additions to their plant. They have installed a complete modern plant for making Painted and Corrugated Iron Sheets, Curved Sheets and Standing Seam and Roll and Cap Roofing. The plates will be rolled in their own mills and the manufactures completed in their own works. They will continue to make Galvanized Steel Sheets and their "genuine old fashioned Charcoal bloom Galvanized Iron Sheets," Eagle brands. They experienced last season quite a demand for genuine Iron Sheets, and claim that consumers are not slow to recognize the high quality of the Eagle brand.

PLUMBING and GAS FITTING.

Musical Gas Testing.

From an article specially translated from our London contemporary, the *Plumber and Decorator*, we quote the following: A new invention for the detection of the gas of fire damp, called by its inventor, M. Hardy, a formenephone, or fire damp warner, is calculated, if it realizes all that is claimed for it, to render inestimable services to the cause of sanitation in general and to gas fitters and various other trades in particular. The original aim of the inventor was to find a means of expeditiously and exactly ascertaining the amount of fire damp gas present at a given time and place in mines; but, in departing from the beaten track of experiment by availing himself of the well-known effect which air of various densities makes on the sensitive pipes of an organ, the French savant has really invented an apparatus which is applicable to all gases alike—the carbonic acid gas evolved, in shut up apartments, from human breathing; the deadly sewer gas; ordinary coal gas; as well as the original object of the inventor's researches, viz., that of fire damp. The following are the principles on which the construction of his apparatus is based: Two organ pipes of the same note give, when fed with pure air by means of separate pairs of bellows, notes of identically the same pitch. When, however, one of these bellows is supplied, instead of with pure air, with a mixture of air and gas of a different density, the note of its corresponding pipe is modified accordingly; and if the two pipes be operated at the same time the respective beats of each pipe will be seen to vary in rapidity, the increase being noticeable on the side of the mixture of greater density. With a little practice a very approximate valuation of the proportion of the mixture may thus be arrived at. . . .

The formenephone is made of two kinds—the portable and the fixed. . . . The services which this apparatus is capable of affording to the cause of health and sanitation is very great—greater even than the undoubtedly large ones to the mining industry, which motived its first inception. It is possible by it, the inventor has demonstrated, to check the quantity of vitiated carbonic acid gas in an apartment, sleeping or otherwise, or in the largest public building; while air contaminated with foul gases, coal gas and other gases hurtful to life are equally amenable to its control, so that the dangers of the naked light of the gas fitter searching for a leak, equally with that of the miner in the presence of a burst of deadly fire damp, may be done away with; while the physician and sanitarian are furnished with a powerful auxiliary in their war with the skulking specters of disease and death which lurk in unwholesome atmospheres.

A BOARD OF HEALTH in Massachusetts, says a local paper, is sometimes confronted with peculiar conditions while inspecting plumbing work. For instance, there is a house near the Waverley line, where the family eat and sleep in Waverley, but bathe in Waltham, the line between the town and this city running diagonally through the house. The same state of affairs exists in a house at the Newton line.

Domestic Electrical Work.—VI.*

By W. A. W.

ANNUNCIATORS AND ALARMS.—(*Cont.*)

The system of wiring for annunciators, previously shown in Fig. 12, applies to all plain annunciator work, excepting, perhaps, in the case of elevator work. On this class of work a cable containing the required number of wires is used between the fixed and movable points. In wiring an elevator one end of the cable should be securely fastened midway between the top and bottom of the shaft, and the wires from the different floors brought to that point and connected with it, and the other end should be fastened in like manner to the bottom of the elevator, care being taken to allow enough slack so that the cable will in no case, either up or down, be drawn tight. The annunciator is placed in the elevator, the battery usually in the basement, and the pushes are located conveniently on each floor in the usual manner.

In Fig. 13 is shown a combined annunciator, fire alarm and return call system. This instrument is well worthy a place in the highest ranks of domestic electrical appliances. It is not only intended as a convenience and comfort, but its most important mission is to give timely warning of impending danger to the sleeping occupants of a large hotel, whom it might otherwise be impossible to reach in time. While there are numerous ingenious and meritorious systems of this class of work, the one shown in Fig. 13 is here adopted, for the reason that it does all any of them can do, and possesses the merit of being extremely simple, and this is a point well worth considering, especially by those having only a rudimentary knowledge of electricity.

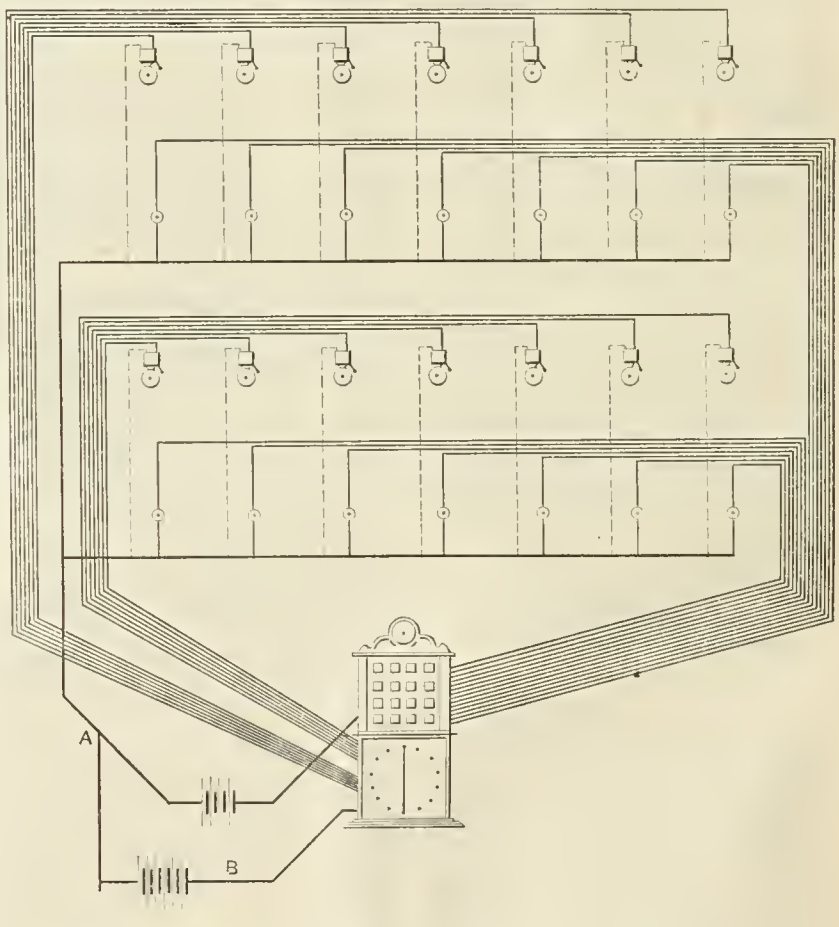


Fig. 13.—Combined Annunciator, Fire Alarm and Return Call Circuit.

In wiring a job of this kind the annunciator part is put in precisely as previously described, with the following additions. A point must be selected for placing the bell, and prepared, as formerly explained, for the push buttons. One wire is run from here and spliced to the battery wire of the annunciator, as shown by the dotted lines in the cut, and the other wire is run direct to the instrument. A separate battery, consisting of six cells, connected in series, must be used. By running a splice from the annunciator battery wire, as shown at A, to this battery and running the

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wire B from this battery to the instrument the wiring is finished. We have now a complete return call system. When a guest rings a call from his room the clerk can instantly indicate to him that his call is receiving attention by simply touching the button on the fire alarm dial corresponding to the number of the room. In case of fire it is only necessary to release the lever, which will cause the bell in every room of the house to ring twice at each revolution, and continue to do so for a long time.

TRAPS AND VENTS.

THE MASTER PLUMBERS' ASSOCIATION of Detroit, Mich., held their annual meeting at the Builders and Traders' Exchange building, January 2. There was a very large attendance, and the following new officers were elected: President, James H. Crumley; vice-president, J. W. Partland; recording secretary, Thomas Norris: treasurer, R. Walsh; financial secretary, W. I. Bolt: sergeant-at-arms, E. J. Ryan; Committee on Sanitation, James Meathe, Samuel Dixon, Hugh McDonald, J. H. Crumley, John Scheatur, Sr.; Arbitration Committee, J. E. Lee, George Lane, J. W. Partland, James Meathe, Benjamin Guiney, Charles Dulleau; Apprenticeship Committee, John McLaughlin, James Cameron, J. E. Lee.

GEORGE RAPLEYE, New Britain, Conn., stove dealer and plumber, has bought out the business of the Automatic Light Company.

THE EXAMINING BOARD OF PLUMBERS of Brooklyn, N. Y., held their first meeting for the year January 5. Commissioners Roche, Gately, Shevlin, Doody and Goff were present. After hearing the report of Clerk Leete regarding transactions of the board for 1893, which showed a good balance in the hands of the city treasurer, they organized for 1894 by electing Chief Inspector of the Department of Health William J. Roche president, F. J. Gately secretary, James J. Doody treasurer, and reappointing George W. Leete confidential clerk.

A LARGE ADDITION will be built to the building occupied by Fleck & Bros., dealers in plumbers' supplies, at 44 North Fifth St., Philadelphia, Pa.

J. C. GREEN AND LEE CHURCHILL of New Berne, N. C., have formed a partnership for plumbing and tinning, and commenced the erection of a building for their headquarters.

THE WALLACE BROS. COMPANY of Lafayette, Ind., were incorporated recently, with a capital stock of $35,000. They will carry on a plumbing business and will contract for the laying of gas and water mains and sewers.

JAMES B. ALGER has sold his plumbing and steam fitting business on Bridge street, Great Barrington, Mass., to William A. Leonard, who has been in his employ. Mr. Alger has accepted a position as engineer at the Riverdale Cotton Mills.

AT THE ANNUAL MEETING of the Master Plumbers' Association of New Bedford, Mass., the following officers were elected: President, Frederick N. Gifford; vice-president, T. J. Gifford; secretary, Charles T. Maxfield; treasurer, Edward F. Penny.

T. F. MCCORMICK, Newport, R. I., has received the contract to supply the plumbing work at the new marine barracks at Coaster Harbor Island.

THE WATER COMMITTEE of the City Council of Jersey City, N. J., recently passed a resolution granting licenses to J. H. Campbell, W. H. Dickinson, Alfrend H. Wilson, H. Dorbrandt, M. D. Lilles, A. J. Jardine, B. J. Keilt and John McComb.

H. MARSHALL has leased S. Stern's store on the south side of the square at Lincoln, Ill., for two years and will move his plumbing stock there.

THE STATE CONVENTION of the Master Plumbers' Association of Ohio is to be held at Toledo, February 13 and 14.

THE FIRM of Knapp & Dillon, Massillon, Ohio, were recently dissolved, Mr. Knapp assuming the settlement of the business, with the expectation thereafter of retiring. Mr. Dillon will establish a shop at his residence and continue in business.

P. J. COLEMAN, Bristol, Conn., has removed his plumbing business from its location on North Main street into one of the stores in the new Linstead Block.

S. A. PECK, plumber, at Greenfield, Mass., has sold his business and stock of goods to S. J. Williams, who comes from Orange, and J. H. Knight of Athol.

THE Board of Plumbing Examiners of Haverhill, Mass., recently organized, with Dr. Croston as chairman and F. E. Sawyer, a well-known plumber, as secretary.

D. J. MALANE, a plumber of Binghamton, N. Y., has recently completed a fine job of plumbing in the block recently erected by Elliott Dauforth at Bainbridge, N. Y.

A FOUR-PAGE CIRCULAR is received from the Boston Paste Company, 46 Beverly street, Boston, Mass., devoted to the merits of Noah's improved machine paste, which they claim is used by plumbers extensively just the same as soil.

THE PORTLAND PAPERS of recent date publish the report of the Inspector of Plumbing, containing the following figures for the work done in the month of November:

Number of first inspections	115
Applications and permits granted	100
Water closets changed from direct to tank wash	50
Vaults removed	3
Final inspection and certificates issued	52

The report also refers to a number of places in Portland where the houses are in bad sanitary condition, particularly those built 15 to 20 years ago, in which the plumbing has not been altered, there being pan closets in the bathrooms and brick cesspools in the cellars. According to the inspector's report the owners and occupants of such houses are averse to making any changes, but it is to be hoped in the interests of sanitary science that if the conditions are as bad as he mentions they will be forcibly remedied.

THE ORDINANCE requiring plumbers to pass an examination and take out a license, adopted by the City Council of Richmond, Va., last September, has not been generally heeded by the plumbers, only two having conformed with its provisions at the first of the year. As a result several plumbers recently appeared before Justice Owens, to answer charges of violating the ordinance. They were discharged, as there was no testimony to show that they had done any work that would violate the ordinance, but stated their intention to become licensed as soon as possible.

THE MASTER PLUMBERS' ASSOCIATION of Cincinnati, Ohio, recently elected Louis Krouse president; J. J. Doud, first vice-president; J. A. Gibson, second vice-president; J. D. Sullivan, treasurer; George Miller, secretary, and A. J. Diehm, sergeant-at-arms. A banquet followed, at which President Krouse was presented with a gavel. Among those present were: Louis Krouse, James J. Doud, John D. Sullivan, George Mellor, A. J. Diehm, J. R. Gibson, F. E. Hopper, Thomas Canary, William Malden, B. Watterman, George W. Porter, A. Bollu, Robert Carroll, John Noonan, P. Ochlemmer, Thomas D. Lynn, Weber & Son, William A. Allison, William Attlessey, E. J. Nolan, William F. Wagner, J. H. Schonhoft, M. Burke, William Lawson, George Elzenhofer, James Manning, Sol Krouse, Charles Hicks, Albert F. Lorber, Mr. Carouthers of Louisville, Ky., and George Harrington.

PRESIDENT FINNERTY of the National Association of Master Plumbers has given notice that a meeting of the Executive Committee will be held in Boston, February 13, 1894.

THROUGH THE KINDNESS of E. J. Brady, 58 Warren street, New York. *The Metal Worker* received an invitation to the annual ball, given at the Central Opera House, by the master plumbers of New York on January 10. Though a light snow storm dampened the night the affair was in every sense a happy one.

The Metal Worker acknowledges an invitation, through the kindness of R. F. Brown, Roxbury, Mass., to the annual concert and ball of the master plumbers of Boston and vicinity at the Odd Fellows' Hall, Boston, on January 9. Though not present to participate in the highly successful entertainment, we know the Boston plumbers dispensed their hospitality with very enjoyable results.

THE PLUMBERS of Manchester, N. H., are agitating an action by the authorities to provide for an examining board of plumbers and the licensing of plumbers. Frank A. Lane and Rufus H. Pike are in sympathy with the movement.

D. L. YARRINGTON was the first plumber to obtain a permit to open a street in the city of Derby, Conn., under the recently passed law.

J. A. HUBLEY has retired from the firm of Longuiel, Hubley & Co., tinsmiths and plumbers, at Halifax, Nova Scotia, and the business will be carried on by Rupert W. Longuiel, under the title of Longuiel & Co.

Essays for the Annual Convention.

The following letter is being sent to the various master plumbers' associations by the Essay Committee of the National Association of Master Plumbers:

The Essay Committee of the National Association of Master Plumbers, appointed by the National Executive Committee at the last annual convention, respectfully invite your association, or a member of it in his own name, to prepare an essay for presentation to the convention to be held in the city of Detroit in June next.

The subject should be a practical question relating to the progress of the trade and the future advancement of it; explanation and criticism of new devices; special requirements for the supply of water and the skill employed by the plumber in the distribution and protection of it; method of house drainage and disposal of waste, adapted to meet the peculiar condition or situation; and the best plan for organization of master plumbers' associations and the proper limit of their action, would be subjects of particular interest.

It is necessary that the essay be placed in the hands of the committee not later than May 15, 1894.

Chicago Master Plumbers.

A large and enthusiastic meeting was held by the Chicago master plumbers, at their rooms, 197 Madison street, Monday afternoon, January 8.

The following officers were elected to serve during the year :

President, Paul Redieske.
Vice-president, Thos. Conway.
Secretary, Alex. Murray.
Treasurer, P. Sanders.
Sergeant-at-Arms, G. A. Larson.

As the Executive Committee is to consist of the above officers, retiring president and three other members, the following were elected to serve on the committee : P. M. Murphy, C. C. Breyer, Jos. B. Breem and the retiring president, T. P. Culloton.

The revised constitution and by-laws, as recommended by the Executive Committee, were duly adopted.

At the conclusion of the business meeting the members were regaled with a banquet, and speech making followed until a late hour.

Philadelphia Master Plumbers' Association.

The annual meeting of the Philadelphia Master Plumbers' Association was held at the Builders' Exchange, in Philadelphia, on Thursday evening, the 11th inst., the president, John E. Eyanson, occupying the chair.

After routine business a communication was read from the Journeyman Plumbers and Gas Fitters' Protective Association of Philadelphia, in which they express their belief that the Master Plumbers' Association is actively interested in the advancement of the plumbing trade and willing to co-operate in any movement to establish laws that would eventually place the trade in a position to which its importance among the industrial trades entitled it. In this belief they set forth the objects of their association, in order to give the master plumbers an insight into the work proposed to be undertaken by the journeymen, such objects being found in the constitution of the Journeymen's Association. The injury, both to the master and journeyman, by the absence of any uniform apprentice system was recognized, whereby so-called journeymen were turned out anything but competent mechanics, injuring the employer by inferior work and creating a feeling of distrust in the minds of the public, and it was the desire of the Journeymen's Association to bring to the notice of the master plumbers that great evil, and their hope that at no distant date they would hear of the Master Plumbers' Association taking some action in the matter.

The Journeymen's Association also recognized the injury to the employer by the journeymen doing work outside of working hours ; in other words, carrying on business to the detriment of the employer while employed by him during the day, and stated that their association would use its influence to discourage such practice. Attention was directed in the communication to the violation of Rule 1 of the Rules and Regulations of the Board of Health, by sewer contractors running drains from the sewer to the curb, and in some cases setting cesspools at the entrances of courts and alleys, there being no registered plumber responsible for the work. In this connection a resolution had been passed at a recent meeting, embodying the determination of the Journeymen's Association to use their best endeavors to adjust these grievances and to secure by State legislation a law making it compulsory for every journeyman plumber to pass an examination before a competent board of examiners, and, in case of failure, prohibiting him from undertaking any work on sewer, drain, soil or waste pipes, or vent pipes from same.

The communication was referred to the Conference Committee, and a reply was directed to be sent to the Journeymen's Association expressing the pleasure of the Master Plumbers' Association to learn of their willingness to co-operate with the master plumbers in elevating the art of plumbing and other matters relating thereto. In regard to apprentices the association, as a body, did not recognize any boy who left his employer for the purpose of obtaining higher wages from another master plumber ; and no member of their association would employ such a boy without the consent of his former employer, who in any case must be a member of their association.

The reply fully explained the position of the Master Plumbers' Association in regard to action on the suggestions contained in the Journeymen's Association's letter, and promised its support wherever practicable.

The special committee appointed to meet the Sub-Committee of Councils on the Ordinance of Councils for regulating the issue of permits for the opening of all paved streets and roads reported progress. The ordinance is as follows :

SECTION 1. *The Select and Common Councils of the City of Philadelphia do ordain*, That before any permit shall issue to remove the pavement or break into any paved street or macadamized road, the person or corporation receiving said permit shall deposit with the treasurer of the city of Philadelphia a sum equal to twice the cost of repaving the approximate number of square yards of paving likely to be removed or broken, at the rate of $3 per square yard, as security that the said person or corporation shall restore said street to good order and condition, and maintain the same for a period of two years from the completion of the work, or to pay the expense thereof, as shall be determined by the Director of the Department of Public Works. Upon the completion of the work one half of said deposit to be returned, and the balance, or so much as has not been used by the said director in keeping the said street in good order, to be returned at the expiration of the said two years.

SEC. 2. In all cases where the city shall do municipal work, directly or by contract, in any of the streets paved as herein referred to, it shall provide, if by contract, that its contractor shall *make* the deposit mentioned in section 1 hereof, and if by pay roll that it will restore the paving and maintain the same for a period of two years, the date of making such repairs to be of record: *Provided*, That permits to remove the pavement or break into any paved street or macadamized road shall cost $2.

All ordinances or parts of ordinances inconsistent herewith be and the same are hereby repealed.

The meeting then proceeded to the election of officers for the ensuing year, when the following were declared elected : President, John E. Eyanson ; vice-presidents, George F. Uber, Samuel W. Barnes, Frank P. Brown, A. G. Bond, G. W. Smith ; recording secretary, William S. Clark ; corresponding secretary, William S. Clark ; treasurer, William Harkness ; Board of Directors, John E. Eyanson, William Harkness, Charles L. Parmalee, William S. Clark, Albert M. Hicks, Frank P. Brown ; sergeant-at-arms, Samuel B. Fleming.

The members then adjourned to the exchange room, where a substantial supper was spread, and the remaindre of the evening was spent in social intercourse.

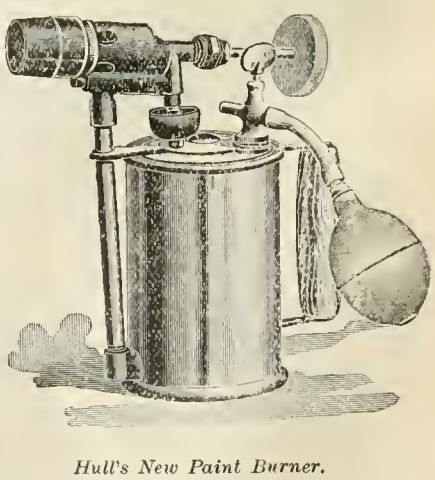
Alaska Handle for Drop Oven Door.

The Troy Nickel Works of Troy, N. Y., have added another to their long list of Alaska specialties and brought out a handle particularly adapted for use in connection with drop oven doors. It is substantially made, with that portion which comes in contact with the hand composed of coiled wire, thus rendering it cool and conveniently handled. The general arrangement of the parts of which it is composed and the means for connecting it to the door are so clearly indicated in the engraving presented herewith that a detailed description does not appear necessary.

Alaska Handle for Drop Oven Door.

Hull's New Paint Burner.

The accompanying illustration shows a new paint burner put on the market by M. L. Hull, 24 Broadway, Cleveland, Ohio, it being made inexpensive "to meet competition and the present hard times," according to the manufacturer's statement. The body is made of brass tubing, with cast brass top and bottom, all of bright brass. It is described as light, strong and substantial. The burner is the same as the maker puts on all his paint burners—that is, a cast iron nozzle, stuffing box to prevent leakage, wood handle, &c. The pump is the ordinary rubber bulb used on plumbers' furnaces, and is said not to be in the way when in use. The manufacturer points out that very little pumping is necessary, as the parts are so arranged that the contents will expand and produce a preasure without pumping. The handle is wood with brass brackets.



Hull's New Paint Burner.

The *Bankers' Magazine*, of London, comparing the values of stocks in 1893 with those of 1892, exhibits a shrinkage of over $300,000,000 in 334 leading securities.

ROOFING AND CORNICE.

Zinc Roofing.

The following description regarding the manner in which zinc roofing is laid abroad has been received from Theodore Philipp, Silver City, Idaho, and will be found of interest to many readers of *The Metal Worker:*

In answer to an inquiry in *The Metal Worker* some time ago, in regard to the method of laying zinc roofs abroad, I will give the readers a description of the same that it is hoped will be of practical use. In 1872 I was working for a firm in northern Germany, and in the town were 84 other tinshops, nine being at the head. In two years the firm I was with put on 16 zinc roofs for the Government and railroads under a guarantee that the roofs should not leak for three years. I had been working on a number of these roofs from start to finish, and had the fortune in 1881 to examine some of them. Although laid for some eight years, the roofs showed but a few small buckles, and the only change noticed was in the color, which was then black, caused by smoke and effects of the atmosphere.

When a zinc roof is to be put on, and the gutter is in the roof, as shown in Fig. 1, we would first place the gutter in position, bending in the inner edge 1 inch, as shown at A, and fasten to the roof by means of bent tin cleats 1½ inches wide, and nailed to the roof as at *a*. The finish at eaves can be made by nailing on strips of tin 2½ or 3 inches wide and any convenient length, allowing the strips to project over 1 inch, as shown at B in Fig. 1 or in Fig. 2. Over this strip the zinc can be bent as shown. Another method for securing the roof at eaves is shown in Fig. 3 at C, where the bent strip of tin extends under the roof boards. With the roof

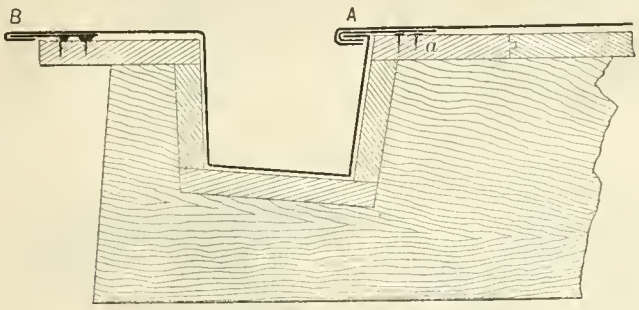


Fig. 1.—Method of Securing Roof at Gutter and at Eaves.

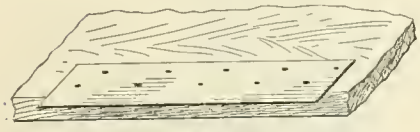


Fig. 2.—Strip of Tin Nailed at Edge of Roof.

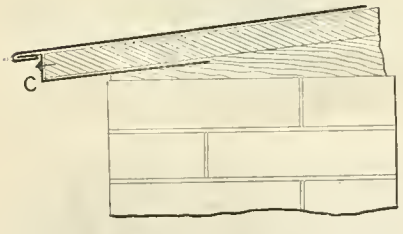


Fig. 3.—A Method of Securing Roof at Eaves.

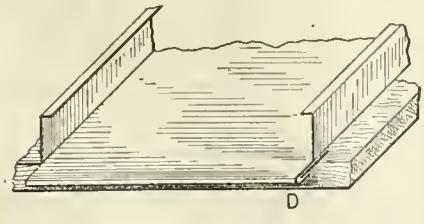


Fig. 4.—Sheet of Formed Zinc Applied to Roof.

Fig. 5.—Cleat Applied at End of Sheet.

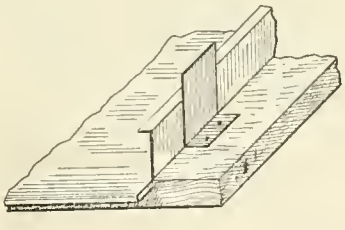


Fig. 6.—Cleat Applied to Zinc Sheet and Roof.

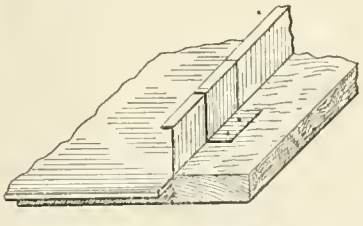


Fig. 7.—Cleat Bent Over Edge of Zinc.

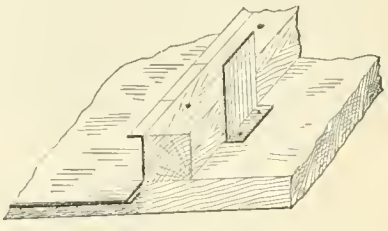


Fig. 9.—Cleats Placed Against Batten.

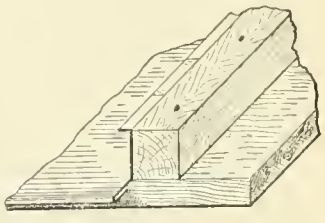


Fig. 8.—Batten Put in Place.

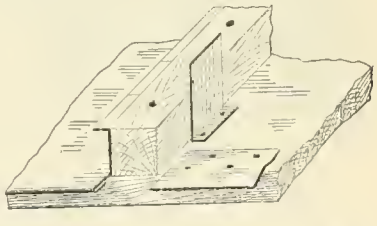


Fig. 10.—Second Strip of Tin Nailed at Edge of Roof.

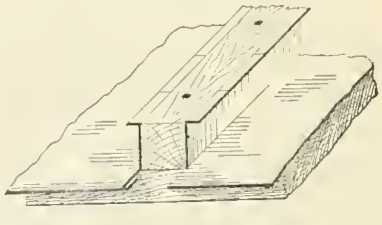


Fig. 11.—Second Sheet of Zinc on Roof with Cleats Bent Over.

ZINC ROOFING.

secured as shown at B and C hanging trough can be used.

The sides of zinc sheets are bent up 2⅜ inches and then over ½ inch, as indicated in Fig. 4. The lower edge of sheet is hooked over the tin strip, as at D, and the upper end turned over and cleated to the roof, as shown in Fig. 5, the cleats being about 8 inches long. This leaves the end ready to receive the next sheet, which is formed as above described and turned ½ inch for cross seams. Cleats are then nailed at the edge of sheet, as shown in Fig. 6, allowing them to extend 1 inch above edge of sheet, and bent over the edge, as in Fig. 7, thus securing sheet to roof without any nails being driven through it and so as to allow for expansion and contraction. Proceed in this manner until the first row of sheets is laid. Two-inch square battens are then placed against the sheets, as indicated in Fig. 8, and secured to roof by means of screws or nails, as may be desired.

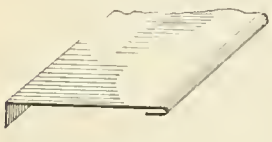


Fig. 12.—The Cap.

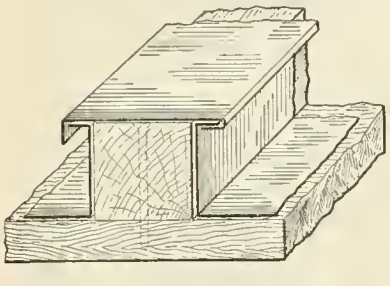


Fig. 13.—Cap Slipped in Place.

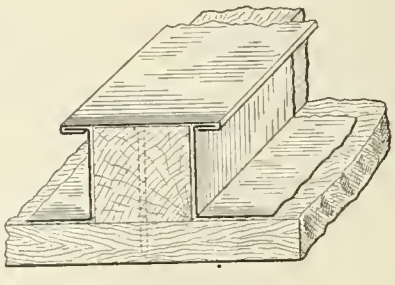


Fig. 14.—Edge of Cap Turned Over for Seaming.

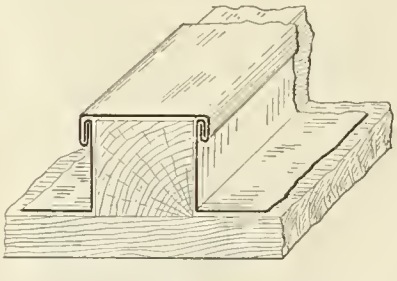


Fig. 15.—Cap Seamed Down at Sides.

ZINC ROOFING.

Cleats are then placed against the batten and nailed to roof, as shown in Fig. 9, and a strip of tin nailed to roof board, as in Fig. 10. If so desired the tin strips can be placed first, and thus under battens, being convenient for fastening to when ends of battens are covered, by soldering over square zinc caps bent over battens to facilitate soldering. The second lower sheet is then laid on the roof, being placed against the batten, hooked over edge strip, and cleats turned over edge, as shown in Fig. 11. After the sheets have been laid, and soldered if necessary, the 2 inch perpendicular seams included, take strips of zinc—say 4 inches wide by 3 feet long—and turn the edges over, as shown in Fig 12, one edge being bent over and the other at right angles. The strips are then placed over the battens, as shown in Fig. 13, each strip being allowed to lap over the other at ends, so the joints can be soldered if desired. The edges of strips are then to be turned over, as indicated in Fig. 14, using the square stake and mallet for the purpose, when they can be double seamed, as shown in Fig. 15. By this method a tight roof can be put on, and one that with good workmanship and material can be guaranteed for five years with safety. No. 12 zinc should be used, although lighter may answer under some circumstances.

A Sheet Metal Dragon.

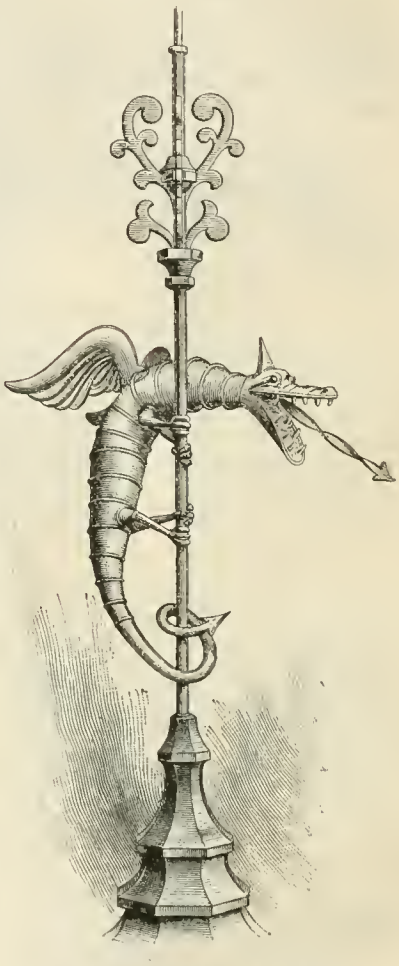
The subject of our illustration is a sheet metal dragon, made by L. C. Caul, Beeville, Texas, and reproduced from a photograph sent to us with the following description:

The design was furnished by G. F. Barber, an architect, of Knoxville, Tenn., and was on a scale of 3 inches to the foot. The dragon is made of No. 26 galvanized iron and mounted upon a 1¼-inch galvanized rod, and projects above the top of house tower 8 feet. It is attached to said rod by steel rods coming through the legs in such a manner as to permit it to revolve with the wind, thereby forming a weather vane. The steel rods entering the legs are met by a flat piece of steel 1¼ x ⅝ inches the shape of the back to which it is fastened by screws, through the back, which serves the purpose of strengthening the whole fabric. The dragon from tip of tongue to dart on end of tail measures 12 feet, and is 9 inches in diameter at largest part of body. The length of time occupied in making it is impossible for me to state, as during the time I was at work I was frequently called off to do other work, which interfered with steady work upon his dragonship. Work in my line, tin and galvanized iron cornice work, in these parts is yet in its infancy, as we are in that part of the great State of Texas that is just now being developed and coming to the front. In a few more years these parts will emulate the large cities in their architectural designs. Already several public houses and banks have been built that are ornamented with iron fronts and galvanized iron cornices, &c.

FLASHINGS.

Some specialties in the shape of metal roofing will soon be placed on the market by W. H. Mullins of Salem, Ohio. The designs were invented by W. R. Kinnear, president of the Kinnear & Gager Company, Columbus, Ohio.

J. H. Eller & Co., manufacturers of iron and steel roofing, Canton, Ohio,



A Sheet Metal Dragon.

state that their business, which was established in 1887, has increased in volume from 75 tons to 1000 tons per year. The extension has not been confined to any particular territory, as new customers have been found in all parts of the United States.

Rhodes, Dickelman & Co., Forest, Ohio, report that they have manufactured and sold about the same quantity of iron and steel roofing during last year as they did in 1892. Their output, including a line of galvanized specialties, has reached 600 tons per year, and their business has held up well during the off year, 1893. In addition to their line of staple goods they manufacture four styles of patented standing and double seam roofing.

The Cambridge Roofing Company, Cambridge, Ohio, report that their large output during the early months of 1893 has kept their average up to previous years. During the closing months and up to the present time business has been somewhat dull, but they are able to keep their force employed filling the wants of customers of long standing.

In spite of the severe business depression existing last year the business of the Central Expanded Metal Company, Pittsburgh, Pa., manufacturers

of expanded metal lathing and fencing, was considerably larger during 1893 than for the preceding year. In Eastern cities the demand for expanded metal lathing has been particularly heavy. In the West the demand is also showing gains, and the outlook in general for the year upon which we have just entered is promising.

WE HAVE RECEIVED with the compliments of W. J. Burton & Co., Detroit, Mich., an attractive calendar for the new year. It consists of a heavy piece of card measuring 10¾ x 14 inches and is provided with a metal eye at the top for hanging it up within convenient reach. The upper portion of the card is embellished with a picture by Detaille entitled "The Soldier's Dream." Below this appear in bold black letters the name and address of the company, with the statement that they manufacture metal cornices, ceilings, skylights and shingles. The 12 leaves for the months of the year are attached to the bottom of the card and give in addition to the usual statistics the various phases of the moon.

A POSTAL CARD with a grotesque sketch on the back of it is sent out by the Victor Mfg. Company, Newburyport, Mass., and calls attention in its way to the Victor roofing cement.

WE ARE INDEBTED to the Canton Steel Roofing Company, Canton, Ohio, for a very neat and serviceable calendar for the current year. It is not of undue size, nor of overgorgeous decoration, but is a simple desk calendar that will be useful to all who receive it. It is a leather frame, 6 x 4½ inches in size, with an eyelet for hanging up; the center of the frame being cut out, showing the monthly card calendar, there being a package of 12 in the leather pocket.

N. A. HALDEMAN & Co. of Philadelphia, manufacturers of corrugated painted and galvanized steel and iron roofing, have sent out to their friends a handy little pocket bank bill case. It is made of Russia leather, with a buff leather lining, and the firm's card appears in gold lettering on the inside flap.

THE numerous friends and acquaintances of James A. Miller will be interested in the news of his marriage, which was celebrated at Chicago on the 6th inst. The bride's name was Miss Martha Hall Shorey.

Herculean efforts are being put forth in New York City to meet the prevailing distress among the poor. The improvements decided on on the North River front and in Central Park are to be hastened, in order to afford work for the unemployed. Similar arrangements are being made by the municipal governments of other large cities where the distress is most acute; and the organized benevolence of private citizens is strained to the utmost to meet the pressing calls upon their charity. It is a hard winter, truly, for the majority.

Sir Edward Watkin, the English railway magnate and promoter of the English Channel tunnel, the great Watkin tower—now rising near London—and other gigantic schemes, is now actively engaged in pushing a project for cutting a canal across Ireland, from Dublin to Galway Bay, in order to shorten the route from England to the United States.

National Iron Roofing Association.

(By Telegraph.)

THURSDAY MORNING.

The National Iron Roofing Association met in St. Louis on Thursday morning, at 10 o'clock, in the Southern Hotel, with President C. H. Conner in the chair.

The following delegates were present:

T. C. Langenbach, Berger Mfg. Company, Canton, Ohio.
C. Holbrook, Canton Steel Roofing Company, Canton, Ohio.
G. H. Needham, Garry Iron & Steel Roofing Company, Cleveland, Ohio.
J. A. Topping, Ætna-Standard Iron & Steel Company, Bridgeport, Ohio.
James G. Battelle and
James Hicks, Cincinnati Corrugating Company, Piqua, Ohio.
A. L. Andrews, Globe Iron Roofing & Corrugating Company, Cincinnati, Ohio.
H. P. Lloyd, and
G. M. Verity, American Roofing Company, Cincinnati, Ohio.
Chas. Aldrich, and
R. B. Whittemore, Jr., American Roofing Company, St. Louis.
R. J. Hyndman, W. G. Hyndman & Co., Cincinnati, Ohio.
C. H. Conner, and
E. H. Conner, Chas. H. Conner & Co., Louisville, Ky.
R. B. Miller, Jas. A. Miller & Bro., Chicago, Ill.
Alex. Glass, and
E. C. Ewing, Wheeling Corrugating Company, Wheeling, W. Va.
Gustav Miller, St. Louis Corrugating Company, St. Louis.
E. E. Souther, and
A. G. Souther, E. E. Souther & Bro., St. Louis.
M. H. Crittenden, M. H. Crittenden & Son, Minneapolis, Minn.
E. C. Brainerd, Columbia Corrugating & Mfg. Company, Niles, Ohio, and Chicago, Ill.

The president's report was read and proved to be an interesting document. He reviewed the work of the past year and referred to the depressing effect which the panic had on general business during the last half of the year, and ventured the assertion that the iron roofing trade would compare favorably with any other line of business. He also made the statement that notwithstanding the innumerable failures which were recorded during the year 1893 not one roofing concern was included in the list. This is an excellent showing, and President Conner took occasion to congratulate the delegates on the excellent record made. He also recommended the adoption, with such changes as the members might desire to make, of the report of the Executive Committee, by which the new United States standard gauge is adopted and adjusted to the use of the iron and steel roofing manufacturers. He closed his address with the hope that a closer union and a more effective and beneficial organization would be the result of the meeting.

R. J. Hyndman, secretary and treasurer, then read the reports of his respective offices. Under the secretary's report he stated that three members had been added to the association since the last meeting, namely Chattanooga Steel Roofing Company, Chattanooga, Tenn.; Columbia Corrugating & Mfg. Company, Niles, Ohio, and Chicago, Ill., and O. K. Harry, Dallas, Texas. He reported that a correspondence had been kept up during the year with manufacturers outside of the association, and these accessions were the result of his labors.

As treasurer he reported a balance on hand, and that the association was free from debt.

J. G. Battelle, chairman of the Executive Committee in his report referred to the fact that the manufacturers of galvanized iron had already adopted the United States standard gauge, and urged the National Iron Roofing Association to do the same. At the October meeting a new price-list was compiled on painted roofing and siding to conform to the new United States gauge, which list Mr. Battelle stated was in the secretary's hands and would be submitted to the members for their final action.

The special Committee on Freight Rates, &c., reported that the effort to secure special classification on roofing tools did not succeed. On conductor pipes, elbows and fittings a reduction of one classification was secured. The general Freight Committee had nothing special to report.

AFTERNOON SESSION.

The important business of the afternoon was the adoption of a scale of prices to conform with the United States standard gauge.

This measure met with the unanimous approval of all the delegates.

The election of officers for the ensuing year resulted in the choice of the following:

President, E. E. Souther, St. Louis.
Vice-president, T. C. Snyder, Canton, Ohio.
Secretary and treasurer, R. J. Hyndman.

The Executive Committee appointed by President Souther is as follows:

Charles Aldrich.
J. G. Battelle.
W. T. Graham.

The midsummer meeting will be held at Niagara Falls, and the next annual meeting will be held in Cincinnati, on the second Thursday in January. Adjournment followed.

The evening was given over to the banquet tendered to the association by the St. Louis members at the Mercantile Club. The banquet room was beautifully decorated and about 65 sat down to enjoy the following:

Menu.

Blue points, half shell.
Sauterne.
Cream of asparagus.
Amontillado sherry.
Celery, olives, radishes.
Red snapper. Chambord.
Potato croquettes.
Sauterne.
Supreme of chicken à la Toulouse.
Peas à la Anglaise.
St. Julien.
Punch à la cardinal.
Mallard duck, fried hominy.
Lettuce.
Fruit, cheese, café noir,
Moet and Chandon.
Brandy.
Cigars.

Toasts.

The toasts of the evening and those who responded to them were as follows:

"Welcome".....Chas. Aldrich, St. Louis.

"Response".....C. H. Conner, Louisville, Ky.

"Our Guests"....E. E. Souther, St. Louis.

"The Rolling Mills and the Iron Roofers" W. T. Graham, Bridgeport, Ohio.

"The Past, Present and Future of our Trade".....G. E. Needham, Cleveland, Ohio.

"Co-operation and Association," H. P. Lloyd, Cincinnati, Ohio.

"The Trade Press".....C. H. Burton, St. Louis.

"Pot Pourri".....Jas. Hicks, Piqua, Ohio.

The banquet ended the eighth annual convention of the National Iron Roofing Association.

Sheet Iron Association.

The regular annual meeting of the Association of Iron and Steel Sheet Manufacturers was held in the *Times* Building, Pittsburgh, on Tuesday, the 9th inst The attendance of members was very large and considerable business was transacted. An election of officers was held which resulted as follows:

J. G. Battelle of the Piqua Rolling Mill Company, Piqua, Ohio, president.

W. T. Graham of the Ætna-Standard Iron and Steel Company, Bridgeport, Ohio, vice president.

John Jarrett, secretary and treasurer.

An Executive Committee was also appointed consisting of W. T. Graham and B. L. Caldwell of Ætna Standard Iron & Steel Company, Bridgeport, Ohio; N. E. Whitaker of the Whitaker Iron Works, Wheeling, W. Va.; B. F. Jennings of Jennings Bros. & Co., Limited, Allegheny, Pa., and W. C. Cronemeyer of the United States Iron & Tin Plate Mfg. Company, Demmler, Pa.

A resolution was adopted appointing John Jarrett and W. C. Cronemeyer a committee of two to watch after the tariff interests of the members, and at a suitable time both of them will appear in Washington and give testimony as to the probable effects the passage of the Wilson bill in its present scope would have upon the iron and steel sheet industries represented in the association. At the conclusion of the meeting of this association an informal meeting of the Association of Galvanized Sheet Iron Manufacturers was held, but no action of importance was taken.

Practical Application of the Pyrometer.

The growing necessity of uniformity in the quality of iron or steel products, says *The Iron Age*, has caused a closer study of scientific phases when metal of specified ductility is required. Old methods of judging by the eye are fast becoming obsolete, and with the increasing use of the pyrometer to ascertain and regulate temperatures of furnaces, the old secrets of managers and others, who have passed them from one generation to another, do not possess their former value.

The pyrometer is by no means a modern instrument, but its utility and value are being daily demonstrated. In annealing malleable castings, sheets of iron and steel and other iron and steel products it is required that a certain temperature be maintained in the furnaces for a given number of hours to produce a desired result. To accomplish this it has hitherto been the custom to train men in charge of furnaces so that they could make a tolerably accurate guess regarding the temperature by withdrawing a stopper and peeping into the furnace. This was a method full of uncertainties, and to make results more positive the pyrometer is now fast coming into general use.

For the benefit of those not having an available table at their command we print below the temperatures of iron, steel and other metals under various conditions according to the very latest scientific investigation:

Temperatures.

		Fahrenheit. Degrees.
Bright iron becomes	yellow	435
	red	500
	indigo	550
	gray	750
Tin melts		445
Mercury boils		660
Lead melts		612
Zinc melts		775
Silver melts		1,775
Copper melts		1,885
Gold melts		1,900
Iron bar, red in	a dark room	950
	ordinary office	1,075
	daylight, open air	1,450
Cast iron melts	white	2,075
	gray	2,220
Annealing	malleable castings	1,600 to 1,750
	sheet iron, No. 20 and lighter	1,600 to 1,700
	sheet iron, Nos. 18 to 10	1,750 to 1,800
Annealing glassware		800 to 1,000

	Centigrade. Degrees.	Fahrenheit. Degrees.
Bessemer Process:		
Running the slag	1,580	2,876
Running steel into ladle	1,640	2,984
Running steel into mold	1,580	2,876
Annealing furnace, ingot in	1,200	2,192
Ingot under hammer	1,080	1,976
Siemens-Martin Process:		
Gas from producers	720	1,328
Gas entering generator	400	752
Gas leaving generator	1,200	2,192
Air leaving generator	1,000	1,832
Fumes passing to shaft	300	572
End of fusion of charge, open hearth	1,420	2,588
Refining the steel	1,500	2,732
Running into ladle, first	1,580	2,876
Running into ladle, last	1,490	2,714
Glass furnace, between the pots	1,375	2,507
In the pots, refining	1,310	2,390
In the pots, working	1,045	1,913
Siemens, melted for casting	1,310	2,390
Blast Furnace, Gray Bessemer:		
Front of tuyere	1,930	3,506
At tapping	1,570	2,858

By preserving this table and carefully using a pyrometer those in charge of furnaces will avoid mistakes which are often very costly. It is frequently the case when new men are put to work at a furnace that they are entirely too energetic. The furnace is kept too hot and the material spoiled, annealing boxes are burned and general trouble results. On the other hand, an old employee, depending too much on his former success, may grow careless and keep the furnace at too low a temperature. The charge is drawn after the furnace is cooled down, the result is not satisfactory and the material has to go through the process a second time at the expense of the manufacturer. By using a pyrometer and enforcing a system of recording temperatures every hour these troubles can be avoided.

Tin Plate Trade Abroad.

J. L. Nash, of the firm of Henry Nash & Co., Liverpool, one of the most prominent tin plate houses in England, is paying a flying visit to this country. Mr. Nash speaks of the tin plate trade on the other side as being in the depths of depression. More than half the mill capacity is idle, and great distress exists among the operatives in some of the tin plate districts, owing to the long continued lack of employment. Yet, he says, the Welsh are characteristically hopeful and look on the brighter side, believing that better times are close at hand. The trade generally in England are anxiously awaiting developments in regard to tariff legislation in the United States, on the settlement of which the future of their business will mainly depend. Mr. Nash thinks that the duty proposed in the Wilson bill—namely, 1⅛ cents a pound—satisfies his countrymen in the trade, who would like to see it carried through. The manufacture of American terne plates has, he says, been a severe blow to that industry in Wales and has almost destroyed it. Hardly any terne plates are now shipped over here, and this material is rarely used elsewhere, except on a very limited scale in England for lining packing cases, &c.

SCRAP.

IT IS REPORTED that the Cleveland Tin Plate Company will build black plate mills at once, and that contracts have been placed for the machinery, the lucky bidders being a well known Youngstown concern.

THE PLANT of the New Castle Steel & Tin Plate Company, New Castle, Pa., is in operation to full capacity, with the exception of the tinning department, which temporarily suspended operations for lack of sufficient stock. The product of the sheet mill is large and the quality very satisfactory.

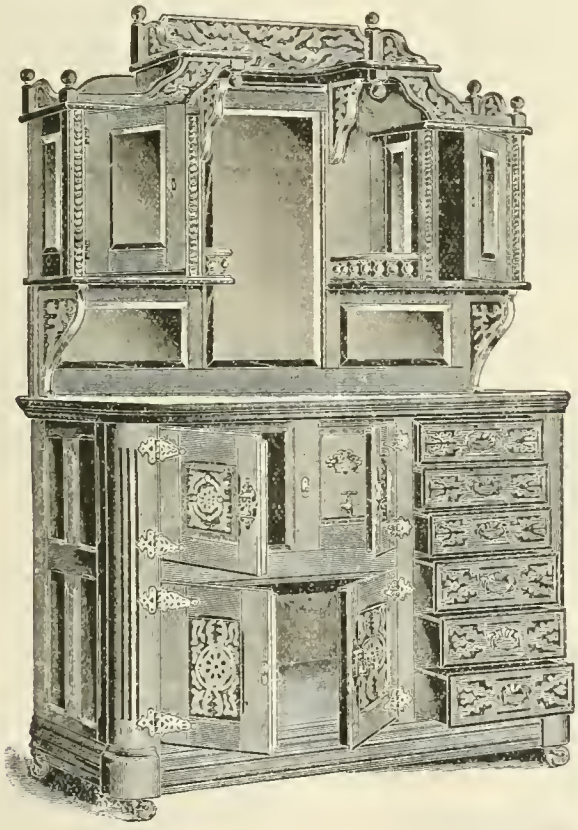
SECRETARY JOHN JARRETT of the American Tinned Plate Manufacturers' Association, leaves Pittsburgh in a day or two for the national capital, where he will address himself to the Senate on behalf of the association in regard to the new tin plate tariff.

EXPORTS OF TIN PLATES from Great Britain for the month of December were 23,000 tons, as compared with 26,000 in the previous month and 34,000 tons in December, 1892. Of this amount 14,000 tons were shipped to the United States, being a decrease of 1000 tons from the shipments of November and 9000 tons from those of December, 1892.

THE RETAIL STORE.

New Sideboard Refrigerator.

The accompanying illustration is a general view of a new sideboard refrigerator known as No. 038, put on the market this season by the Challenge Corn Planter Company, Grand Haven, Mich. It is a very complete and elaborate sideboard refrigerator, and is referred to as especially useful for a club house, though it makes a convenient dining room sideboard as well. One



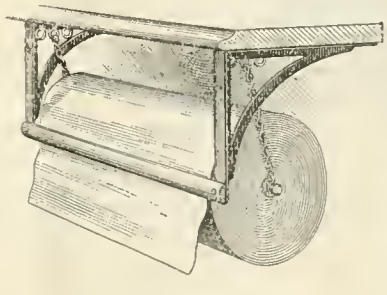
New Sideboard Refrigerator.

side of the refrigerator has drawers, as shown in the cut, for the storage of table linen, silverware and such articles, while on the other side is the refrigerator proper, which is made the same as in the other refrigerators of this concern. The water cooler, faucet and cup holder are in a recess, to which there is a door, as shown, so that they are entirely hidden when the door is closed. The cooler itself is a drawer which can easily be taken out and cleaned the same as any ordinary dish. The sideboard top has two cabinets, with glass panels in the ends and glass doors in front for the display of bric-a-brac, &c. Between these cabinets is a large French plate mirror. The wood is elaborately carved, as shown, and the trimmings are of bronze, while the whole is furnished with patent casters, floor plates and locks.

Charles B Nash, a prominent stove dealer in Portland, Maine, died on the last day of 1893 at the age of 58 years. He was a native of Raymond, and was the last of five brothers, four of whom were for years prominent in the retail stove trade. We understand that for 33 years the late Mr. Nash occupied a store on Fore street, where he conducted an extensive business.

A Novel Roll Paper Holder.

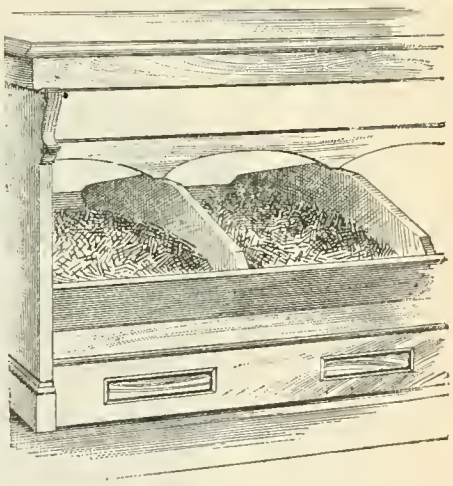
To avoid marring a handsome counter top of quartered oak by putting a paper holder on it, Widenor Bros. of Belvidere, N. J., made one to be placed in the rear of the counter, as shown in the accompanying cut. The material required for the device consists of a pair of 5 x 6 plain shelf brackets; a piece of $\frac{7}{8}$ inch half oval iron, three inches longer than the paper roll; two $\frac{3}{4}$ x $\frac{3}{16}$ inch stove bolts; two pieces of No. 10 jack chain, each 4 inches long, and six No. 108 screw eyes. The cost of these is put at 10 cents, and about an hour's time was required to construct the holder. A hole was drilled at each end of the half oval iron and countersunk to receive the stove bolts. The iron was bolted to the end of each bracket to form a cutter, and the brackets screwed to the underside of the counter at the proper distance apart. The screw eyes were put into the counter at the inner edge of the brackets, three in a row; and to corresponding eyes on each side the pieces of chain were hung. A wooden roller with a 1½ x $\frac{3}{16}$ inch oval head rivet in each end was put through the center of the roll paper; and on the rivets the chains were hooked. As the paper roll becomes smaller, the chains are hooked into eyes nearer the front, thus always keeping the roll swung against the cutter with sufficient force to allow of tearing the paper off. The holder may be put under any part of the counter which is most convenient: the counter in the illustration is cut off to show the holder to the best advantage.



A Novel Roll Paper Holder.

Double Nail Bins.

We give herewith an illustration of Nail bins used by Frank Alexander & Co., Staunton, Va. They are located under two 20-foot counters, and are open on both sides. Our correspondents consider this arrangement advantageous, as Nails can be weighed from either side, and customers can select the Nails from their side of the counter better than they can describe what they want. Each bin contains two kegs of Nails, and the space between the bin and counter is sufficient to allow a keg of Nails to be thrown in, thus saving the trouble of first emptying them into a scoop. These bins the firm consider more convenient than any other design they have seen. It is suggested that if desired the bins can be made smaller, or that each bin may contain two kinds of Nails, the sizes being separated by a partition running lengthwise of the bin.



Double Nail Bins.

The Darling Filters.

Darling Filter Company, 26½ South Water street, Cleveland, Ohio, are offering the filters represented in the accompanying cuts. The Self Cleaning filter, shown in Fig. 1, has a glass casing, which is used where the water pressure is not over 75 pounds to the square inch; where more than that a nickel casing is used. The manufacturers state that the filter never has to be taken apart to be cleaned and that a feature peculiar to this filter is the forcing of the cleaner against the porous tube, so that by revolving the goose neck at the top of the filter a few times the tube is cleaned. One of the valves at the bottom of the filter is for carrying off the accumulated dirt and the other valve is for supplying the water to be filtered. The point is made that through the glass casing the dirt can be seen accumulating on the porous tube and also disappear in cleaning. The filter has been tested in Cleveland, St. Louis, Kansas City and at other points. The report of an analytical chemist at Kansas City states that a chemical analysis and microscopical examination showed that all suspended matter, as well as a portion of the organic matter, had been removed and that the water was free from microbes existing in the unfiltered water. The manufacturers claim that the filter is absolutely germ proof, that it will filter from 10 to 15 gallons of water per hour, and that it is cleaned in three minutes, without shutting off the water or taking out the tubes. Fig. 2 shows the Little Darling filter, which is taken apart for cleaning. This is done by simply unscrewing the screw at the top of the filter, lifting the nickel casing out and brushing off the porous tube. The Little Darling is shown in Fig. 3 attached to a water cooler. The cooler is provided with two reservoirs, one for ice and the other to hold 3 gallons of filtered water. It also has an automatic valve for closing the filter when the reservoir is full. This arrangement is designed for use where a large quantity of filtered water is required.

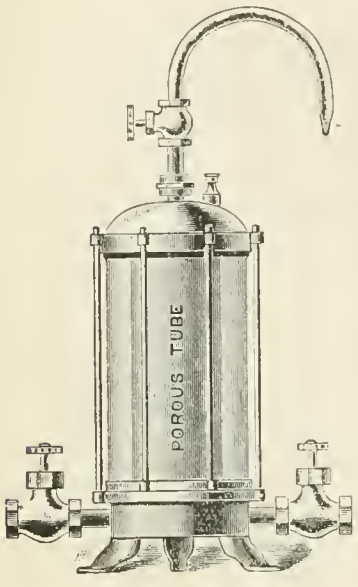


Fig. 1.—Darling Self Cleaning Filter.

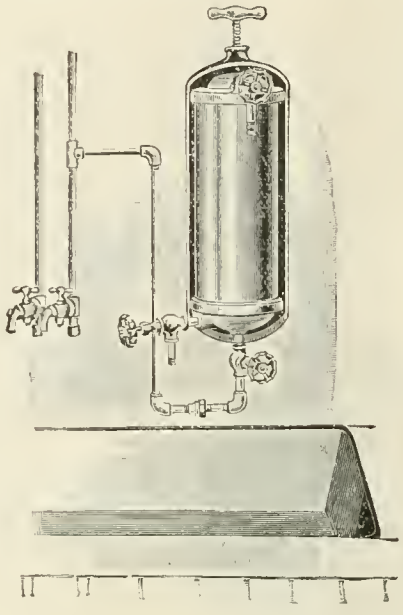


Fig. 2.—Little Darling Filter.

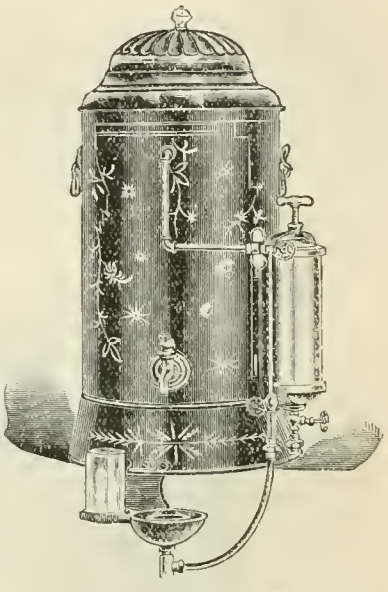
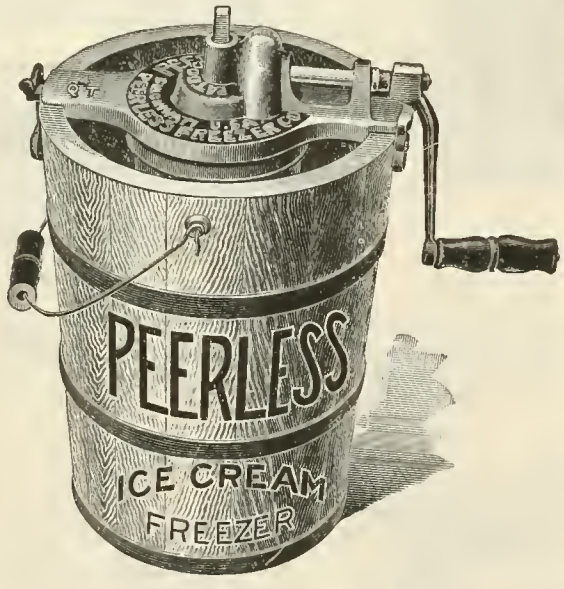


Fig. 3.—Little Darling Filter and Water Cooler.



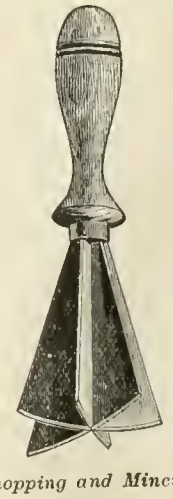
New Peerless Ice Cream Freezer.

New Peerless Ice Cream Freezer.

Peerless Freezer Company, 28-38 East Ninth street, Cincinnati, Ohio, J. C. McCarty & Co., 97 Chambers street, New York, agents, have improved their freezers as represented herewith. Besides covering the gearings, additional leaves have been placed on the dasher frame, which, it is explained, disintegrates the cream more rapidly and thoroughly, and provides for the better circulation of air through the same. The middle wheels, instead of being cast separately, as formerly, are now cast in one piece and in such form as to provide an automatic reservoir for receiving oil drippings. It is stated that its present form also makes the apparatus salt water or oil proof—that is, permits neither of these elements to enter into the cream chamber. The standard heretofore passing through the cast tub top now engages with the middle wheel, leaving no opening whatever for salt, water or oil to get through into the cream. The manufacturers claim that the freezer is full size, that it has as many motions as are practicable, that the whole machine now requires fewer parts, is easily put together, less liable to get out of order, and that the tubs on each size of the freezer are unusually heavy.

Victor Chopping and Mincing Knife.

The cut here shown represents the Victor chopping and mincing knife, being offered by the Clauss Shear Company, Fremont, Ohio. The blades are of such a quality of steel as to hold an edge, and may be sharpened with a file when necessary. The position of the handle, it is stated, is such as to make chopping easy, the knife doing a large



Victor Chopping and Mincing Knife.

amount of work in proportion to the labor expended. It will cut fruit and potatoes into neat pieces for frying and preserving ; one stroke giving, if desired, six equal pieces of fruit or potatoes. It is also recommended for making steak tender, by cutting the fiber and not bruising it. The manufacturers claim that the knife is strong, simple, cheap and durable, and that it is easy to clean and sharpen.

Columbia Washing Machine.

The Columbia washing machine, illustrated herewith, is put upon the market by the Richmond Cedar Works,

Columbia Washing Machine.

Richmond, Va. The washer is made of selected Virginia white cedar as best adapted for resisting the action of water, and is provided with heavy castings, all castings, hoops and trimmings galvanized to avoid rust, which stains clothes. The bottom and sides are corrugated on the inside of the machine, and, it is stated, the corrugations are so evenly tapered off where the bottom joins the side of the tub that no cracks are left for any fabric to catch in, nor in which dirt may collect. The point is made that the bottom is in the large end, to prevent clothes from wedging.

The Monarch Grate Guard.

The accompanying illustration represents a grate guard, introduced by the Cincinnati Mfg. Company, 211 Walnut street, Cincinnati, Ohio. As shown in Fig. 1, the guard is made from wire

Fig. 1.—The Monarch Grate Guard.

rod of No. 4 gauge, so formed and bent as to readily admit of its being placed in position over the top bar of a grate, as in Fig. 2, to which it adds a depth of 3½ inches. The loops in the guard are placed sufficiently close to each other to prevent the live coal from falling out. The guard is designed to provide an extra capacity for grates that are not deep enough to fulfill the requirements made upon them. The

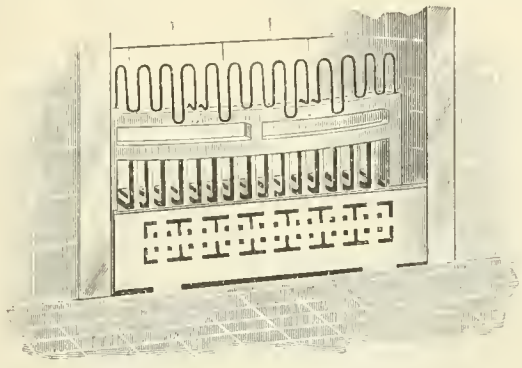
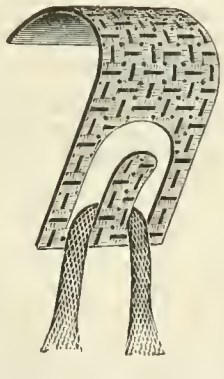


Fig. 2.—Grate Guard in Position.

guards are made in four sizes, for 20, 22, 24 and 26 inch grates. The manufacturers claim that the guards are strong, light, durable and thoroughly practical.

Picture Hanger.

Julius Berbecker & Co., 65 Duane street, New York, are marketing the picture hanger or molding hook as here shown. These hooks are made in but one size and of one pattern, and it is claimed that they will fit any mold-

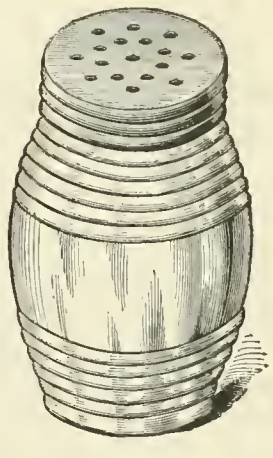


Molding Hook or Picture Hanger.

ing from 1 to 2 inches. One of the principal features to which attention is called is their adaptability to almost any molding, and at slight cost. They are made of steel, brass finished. Another point emphasized is that should a wire break or become detached the wire will not draw through or allow the frame to fall.

Tack Salt Shaker.

Chicago Tack Company, 7700-7800 Woodlawn avenue, Chicago, are putting up carpet tacks in shakers, as shown in the accompanying illustration. The shakers are of crystal glass, with metal tops, perforated for salt or pepper. The salt and pepper shakers are the same, except that the perforations in the cap of the pepper are smaller than the salt. The shakers are designed for table use when emptied of tacks. The goods are packed, half salts and half peppers, in half gross cases, filled with carpet tacks made by the company which they refer to as being of fine



Tack Salt Shaker.

quality. The packages are designed to retail at 5 cents each.

THE SIXTH DINNER of the Hardware and Metal Trades of New York will be held under the auspices of the Hardware Club at Sherry's, on Tuesday evening, February 27. Tickets, at $5 each, can be obtained from A. D. Clinch of Underhill, Clinch & Co., 94 Chambers street. The opportunity of securing tickets is first offered to the members of the Hardware Club, and the committee in charge of the dinner are desirous of hearing as early as possible from those who are intending to purchase tickets. The number of tickets issued will necessarily be limited, so that it will be wise for those who desire to attend the banquet to send in applications at an early day. It is hoped that the gathering will be a representative one, as has heretofore been conspicuously the case, and that the trade outside of the city and throughout the country will be present in gratifying numbers.

OHIO LANTERN COMPANY, Tiffin, Ohio, are getting out a new side lift Lantern, which they predict will prove a successful competitor with any similar goods now offered. A full line of their goods is carried in stock at their New York address, 81 Chambers street, W. W. Pryor & Co., agents.

STOVE TRADE NOTES.

Stove Trade Reminiscences.

A correspondent, who evidently reads with a great deal of interest what our old friend "Jeems" has to say, sends, under the *nom de plume* of "Old Mack," the following letter:

I have always taken great interest in the effusions of "Jeems," your valuable correspondent, and in *The Metal Worker* of January 6 he gives the sayings of "ould Tim," which he thinks should be buried with the past. Not so, think I, for I stand by Tim because I am of the old stock. While hundreds of young men have come to the front in the stove business, I do not see that that should be a proper cause to switch off the fine old ones or their expressions, altogether. Now let "ould Tim" and old Mack just sit down and compare a few notes of 50 years ago about the stove business in New York City. Tim, do you recollect when J. L. Mott kept a store at 23 Bowery, for if you do not, just come down to Cliff and Beekman streets, and see what has come of it? If my recollection is correct I am not at fault in pointing out where the acorn was planted from which sprung this great oak. About Tim's working for Cunningham in Water street, that may be so. All Mack's recollection of Cunningham was when he kept a stove store in Grand street, just east of Joshua Underhill's place of business. There was great competition between them in stove selling; and when one would throw in an extra pipe head the other would go one better, and so it came to pass that if the customer would stand out long enough, telling what the other store would do, he very likely would get a large portion of the tinware of the seller. About this time James put his saddle log stove on the market. Does Tim recollect that? No small vessel, in its galley, was complete without one of them. I might go on with the questioning indefinitely, but *The Metal Worker* might get tired, as "Jeems" seems to have quit twaddling about stoves, &c., as they appeared 50 years ago.

The Boynton Furnace Company.

195 and 197 Lake street, Chicago, are issuing a very handsomely printed card referring to their remarkably large line of heating apparatus. They are prepared to meet the demands of the trade for hot air furnaces and low pressure steam and hot water heaters to suit any requirements. The card illustrates some of the leading types of their furnaces, of which they make over 100 styles and sizes, and also presents illustrations of steam and hot water heaters. One side of the card is devoted to a statement of the comparative and approximate heating capacity of the Boynton Furnace Company's coal and wood furnaces. It often happens that information is specifically desired as to the size and style of furnace adapted to economically and efficiently heat a house of a certain size, or a number of schoolrooms or a large single room, store, church or public hall. Such information is here given, arranged in tabular form, so that it is a comparatively easy matter to select the style and size desired. These tabulated statements are based on the experience of many years in the use of the company's apparatus under all conditions, and are therefore not merely theoretical estimates. The card will be found worthy of preservation by the trade for frequent reference.

The Chicago branch of the company is under the management of J. H. Manny and C. E. Manny, through whose untiring efforts their business steadily increases.

ODD PLATES.

We are indebted to the Troy Nickel Works, Troy, N. Y., for a copy of the 1894 catalogue of Alaska goods, which is being distributed to the trade. This is the thirteenth annual catalogue and price-list and in it the manufacturers state that they have added to their line many improvements during the past year. The Alaska line of specialties are referred to by the makers as "strong and durable, yet light and convenient to handle." These goods, as our readers are aware, have met with an extensive sale, not only in this country but abroad, and in the catalogue which the company issue for 1894 illustrations are presented showing the general appearance of the various styles turned out. All Alaska goods are fully covered by letters patent, and in offering them to the trade the Troy Nickel Works call attention to the following points: 1, that the "gooda will not become hot and impossible to handle;" 2, "they will not become loose and rattle," and, 3, in the knobs the tension of the spring locks the nut and prevents its turning and allowing the knob to become loose.

J. E. Allen, in former years connected with the New York store of Richardson & Boynton Company, has reentered the employ of that concern and assumed the management of their Boston store, at 94 Union street. Mr. Allen is well known to the trade and comes back to his first love with renewed enthusiasm and the good wishes of his associates.

W. F. Habicht is visiting the trade in Pennsylvania and Clark B. Smythe the trade in Virginia in the interest of Novelty stoves, Challenge Iceberg refrigerators and New Process and Splendid Novelty gasoline stoves, handled by F. M. Borden & Bro., Philadelphia.

George W. Gardner died at Troy, N. Y., Friday, January 5, in his seventy-seventh year. He was born in Canaan, Columbia County, and the greater part of his life was spent in the foundry business, he being for 17 years general manager for the Fuller & Warren Company, Troy, N. Y. He was afterward engaged in the manufacture of stoves on Green Island, near the city of Troy. Mr. Gardner was very ingenious and was the inventor of many little contrivances, which he used in his foundry work. He was a Mason, was an active fireman before the days of the Fire Department, and was a member of several volunteer companies.

Every stove plate foundry in the city of Albany, N. Y., is now shut down for the annual inventory and repairs, and this throws about 1000 men out of employment. Most of the foundries are said to have a large stock on hand on account of the poor trade caused by the general depression. Some of the smaller foundries, especially those doing job work, are running on short time. However, the proprietors are hoping for a brighter outlook soon.

"Jewel Gasoline Stoves" is the title of the 1894 catalogue which is being distributed to the trade by George M. Clark & Co. of Chicago, Ill. Its make up shows evidence of careful arrangement, the printing being neat, and the binding is in attractive covers. In offering Jewel gasoline stoves for the thirteenth time the manufacturers call attention to new features and improvements which have been incorporated in their lines for the season of 1894. The process stoves have been improved by the addition of a shield which is removable, protecting the brass tubes above the stove top; there is a large burner on the step of the step stoves and in the oven of cabinet ranges; a cast iron shield to protect the small tubes near the burner caps; a removable strainer wire at the filling funnel; the tank is finished in brass instead of copper; large nickel-plated Jewel name plate below the tank and a two-burner process stove made without step. In connection with single generator stoves, No. 85 is highly ornamented and has new oven doors, while No. 95 is made with a lower door. Among individual burner stoves there is a new line of Jewel juniors, a new line of Jewel-Acmes, while all Jewel junior and Jewel-Acme stoves are furnished with Jewel lay down safety tanks with brass bottoms. The Jewel junior and Jewel-Acme low stoves are listed with lay down tanks at the price of stationary tank stoves of last year. The Jewel goods are illustrated and described at great length, particular attention being given to the special features which are provided. In the way of stove furniture, ovens, cookers, waffle irons, toasters, flat iron heaters, broilers, &c., a varied assortment is presented.

"The Charter Oak Almanac for 1894" is the title of a 48-page publication which reaches us from the Excelsior Mfg. Company of St. Louis, Mo. In addition to a calendar for the year there is given an astronomical storm chart covering 12 months, together with astronomical phenomena, &c., for the period named. Scattered through the volume are illustrations of a varied character, while there is to be found more or less of that class of literature known as light reading. As the pamphlet is issued primarily for advertising purposes, it is natural to find that it has a great deal to say about Charter Oak stoves and ranges. Numerous receipts

for the housewife constitute another feature of the almanac, which will prove interesting to the recipient.

THE AUBURN STOVE FOUNDRY COMPANY of Auburn, Maine, have commenced the work of repairing the buildings recently damaged by fire, and it is the expectation to have the plant again in running opreation next month.

THE INDIANA STOVE WORKS of Evansville, Ind., have set aside from their profits the sum of $1000 to be used as a sick or accident fund for the benefit of their employees. Those who by reason of illness or accident are unable to work will be paid a certain weekly sum, the married men receiving $5 per week, unmarried employees $3 and apprentices $2. In order that all may be treated fairly it is stipulated that the benefits named are to be paid after the beginning of the second week of continuous illness. It is also understood that no employee shall be entitled to a benefit for illness brought on directly by, or attributable to, himself, or to accident or disability that may result from the transgression of any of the laws of the city or State. It is further atipulated that the sum of $1000 shall be the maximum amount to be paid in benefits during 1894, and "should the sum named be exceeded before the close of the year, the payments of any and all benefits shall immediately cease." The benefits we understand, are applicable only to those who have been in the employ of the company for at least one year. In the circular which the company have issued to their workmen, they state that they deem it best to exclude from the benefits named any transient helper, as it is their aim to benefit only their regular employees, and the hope is expressed of being able to so conduct their business relations as to enable them to operate their works by men whose names and faces will always be familiar and in whose advancement the company may ever take a deep interest.

THE ECLIPSE STOVE COMPANY of Mansfield, Ohio, will be represented on the road during 1894 by the following traveling salesmen, who will cover the territory named: C. A. Munsell, in Western New York, Western Pennsylvania and Eastern Ohio; J. S. Cadot, in Western Ohio and Eastern Michigan; M. J. Weldon, in Western Michigan and Indiana; W. J. McKay & Co., in Cook County, Ill.; B. H. Cook, in Northern Michigan; H. D. Bell, in Illinois; J. C. Bump, in Wisconsin; the Townley Stove Company, in Southwestern Indiana and Southern Illinois; Charles Baldwin, in Iowa, Missouri and Nebraska, and H. E. Cook, in Minnesota and the Dakotas.

THE ROUND OAK STOVE WORKS of Dowagiac, Mich., resumed operations the first of the year with a force of about 300 men.

THE STOVE FOUNDRIES in Taunton, Mass., have been closed recently for the purpose of taking account of stock and making necessary repairs. The Weir Stove Company and the foundry of O. G. Thomas are expected to resume operations shortly, but according to local papers there seems to be a doubt about the immediate resumption of operations at the plant of the Cobb Stove and Machine Foundry.

THE WROUGHT IRON RANGE COMPANY of St. Louis, Mo., have for some time past been making active preparations for their exhibit at the Midwinter Exposition in San Francisco, Cal. They also intend, in the course of the next few weeks, to open a branch store in the city named, so that they can ship their goods to that point by the carload and thus secure the advantage of better rates of freight than they would be able to obtain on less than carload lots.

THE GRANDER STOVE WORKS of Royersford, Pa., according to press dispatches, expect to resume operations in all departments of their works on January 20.

THE DANGLER STOVE & MFG. COMPANY, Cleveland, Ohio, furnish us with a copy of the illustrated catalogue and price-list of gasoline, vapor stoves and ranges, which has just been issued from the press. It is a volume of 48 pages, neatly printed and bound in colored paper covers. The side title is embossed in letters of old gold upon a black ground. The frontispiece is a bird's-eye view of the company's works, following which is an announcement to the trade. The volume is the fifteenth annual catalogue which the company have issued, and in it attention is called to new goods and improvements which have been incorporated in their leading specialties. The construction of the New Delight is referred to as being substantial, convenient and attractive, as well as greatly reducing the possibility of accidents. The company say they will continue to manufacture a full line of single generator and individual burner stoves with the new frame and design which has proven so popular; also high and low junior stoves, as well as half high, with lay down tanks. Directions are given for the care of gasoline stoves, together with a telegraphic code, price-lists, &c. The stoves are illustrated and described, and directions for operating the Dangler process stove and lighting the Surprise burner are presented. The assortment shown is an extensive one, and is followed by stove furniture of interest in this connection. The Dangler radiator with the burner at the bottom of the center tube opposite a small door in front, and the Dangler gas range with water heater extension and step are features of the catalogue.

HENRY E. AND ARTHUR JANES, the senior and junior partners of Janes & Kirtland of this city, have returned from a month's sojourn among the wild woods of Maine, where all business cares were laid aside, and where, "roughing it" in true huntsman's style, they were both greatly benefited. We had the pleasure of a general and hearty invitation to call at their establishment, where they have on exhibition in one of the large plate glass windows two heads of the *Alces Americanus* or American moose. These animals stand 8 feet in hight and have antlers that spread 5 feet. They are very finely mounted, and prove the greatest attraction ever seen in the local stove district.

THE FAVORITE STOVE & RANGE COMPANY, Piqua, Ohio, favor us with an advance copy of their spring supplement, which is a beautiful example of the printer's art. The front cover is embellished with a combination design wrought in colors of delicate shade, and while largely typographical is rich and artistic. The matter includes the name and address of the company, a *fac simile* of their trade-mark and the statement that the spring supplement shows a new line of wood and coal and wood cooking stoves. Across the top of the cover is an oblong panel carrying a design consisting of sprays of flowers, birds and butterflies, while in one corner is the date 1894. In offering this supplement to the trade the company express their appreciation for past favors and refer to the additions made to their manufacturing capacity during the year 1893. These included a large engine house, a 200 horse power Corliss engine, two boilers of 125-horse power each, new japanning ovens, a building 50 x 200 feet, molding floors 100 x 112 feet, together with considerable new machinery. The goods, which are illustrated in the supplement are known under the name Favorite, and are finished in first class style. All the latest improvements are incorporated, including those features which in the past have rendered the favorite line of stoves so popular with the trade. The construction intended for burning coal and wood is made in four sizes, with ovens ranging from 19 x 19 inches to 21 x 21 inches, water fronts being provided for all sizes. The Favorite, for wood only, is made in the same number of sizes as the one just referred to, with ovens of equal dimensions. The last page of the cover is devoted to a handsome bird's-eye view of the works of the Favorite Stove & Range Company, the entire depth of the buildings being 1270 feet.

THE FULLER & WARREN COMPANY, Troy, N. Y., favor us with special advance sheets for their 1894 illustrated catalogue, showing a new furnace made in 20 different modifications and sizes. This line of heaters has been brought out to meet the great demand for a powerful, simply constructed, easily regulated, low price hot air furnace. It is referred to as being economical in fuel, absolutely gas and dust proof, and as having large ash pit, chain dampers arranged so that the fires may be regulated from the floor above, steel dome and radiator, constructed of polished wrought steel, extra heavy, and all parts exposed to the direct action of the heat; clean out door for casing made extra large, and casing rings with patented device for bolting together. The entire furnace is said to be easily set up and operated. Attention is also called to the hot water heating attachment as used in connection with their furnaces. We understand that the company will soon issue to the trade their complete furnace catalogue.

JAMES LAWRENCE, bookkeeper for Sam S. Utter, has recently had the appearance of his counting room greatly improved by a new carpet and a brand new high polished mahogany desk. The surroundings are beautified with ornamental railing, bronzed in gold, and of a high order of finish. "Jimmy" is one of the most sociable of companions and has the faculty of knowing how to tell a good story. The genial Sam says he is one of the most accurate accountants in Beekman street. Jimmy has invented several short cuts in doing addition, known as the chain rule, by which four columns of figures may be added at once; also a new method of averaging and computing interest at any rate.

THE RINGEN STOVE COMPANY of St. Louis, Mo., have issued an 1894 catalogue of Quick Meal gasoline stoves, which they manufacture in great variety. The volume is of the usual size and style issued in previous years by this concern, and within the covers are found illustrations of goods which have been improved for the coming season's trade, as well as those which the company have recently placed on the market. The frontispiece is a general view of the company's new building on

Chauteau avenue, while in their address to the trade they refer to the sales of Quick Meal stoves for 1893, the figures being 71,316. The statement is also made that the 1894 line of Quick Meal evaporating stoves has been vastly improved in appearance and that all cabinets are now provided with a base, greatly enhancing the general effect. The backs have been beautified by the substitution for the somber black of marbleized panels and surrounding a pair of tile in polished brass frames. The dial plates, heretofore separate, are now combined in one nickel plated shield, which carries the number of the stove. All junior stoves have been provided with turn down tanks. A number of testimonials with regard to Quick Meal stoves are presented, after which we find illustrations of evaporating and single generator styles of Quick Meal goods. Special attention is invited to the Quick Meal torch No. 6, for gasoline, which is a recent addition to the company's assortment, and also to the Quick Meal paint burner, for gasoline, which has been brought out as a great improvement over all others. The handle is adjustable, turning loosely on the tank, so that the flame may be thrown in any direction without inconvenience in holding the apparatus.

We are indebted to the Phillips & Clark Stove Company of Geneva and Troy, N. Y., for a calendar of the same general make up as that which they sent out in the early part of 1893. It is in the shape of a card easel, to the lower portion of which is attached a calendar, diary and memorandum combined. There are seven spaces to a page, giving one for each day of the week, and ruled with lines for purposes of memoranda. A page is devoted to information of a useful character, such as rates of domestic and foreign postage. There are also given yearly calendars for 1894 and 1895. The upper portion of the card carries the name and address of the company, together with a *fac-simile* of their trade-mark. The arrangement of the calendar is such that it may be used as an easel on the desk, or it may be suspended upon the wall by a cord provided for the purpose.

J. B. Oldershaw of 628 North Eutaw street and Nos. 400–402 Druid Hill avenue, Baltimore, Md., is directing the attention of the trade to a stove possessing many interesting features of construction. Under the swinging dome or cover is a 7-inch boiler hole, which may be utilized for heating water or cooking, if necessary. This cover is back of the center and immediately over the direct flue damper. The base of the stove at the back is perforated for the purpose of admitting air from the floor to an air chamber, which is formed by a Russia iron half body extending from the sides and around the back. This construction makes an air chamber 2½ inches wide, which extends to the top of the stove. The air chamber is continued over the fire to the perforated front, on which there is a pipe collar and damper to suit with an ornamental top, the latter and the damper being movable. When used as a double heater the stove is provided with a pipe which is fitted to the collar on the fret work front and extending to a register in the floor above. When the damper is opened the entire back of the stove is brought into requisition to heat the room overhead. The heating pipe is in front of the center of the stove, and, it is claimed, does not interfere with the boiler hole or swing cover. The stove is referred to as being neither round, square nor oblong and as a new departure in construction and design.

The Aurora Vapor Stove Company of Cleveland, Ohio, favor us with a copy of a well arranged catalogue just issued by them relating to gas and gasoline stoves. The lines of goods covered are made under the name Aurora, the leading place being given to an evaporating range having two burners in the top and one in the shelf or step at the side. The stove has a cast iron top, front and base and drop oven door. Several sizes of Aurora evaporating stoves are shown, followed by the New Aurora range, provided with the company's hot generator and patent concentric burners on the top and shelf. The ovens are heated by double burners 18 inches long, cross slotted, the upper one being especially intended for baking and the lower one for broiling. The top, front, posts and base are of cast iron and the sides and back of cold rolled steel, all japanned, while the door centers are nickel plated. Both the ovens are asbestos lined. A variety of junior stoves are presented, together with special instructions relating to the Aurora evaporating stoves. The closing portion of the catalogue is devoted to Aurora gas stoves, of which a large line is shown. The New Aurora furnace, North's ventilated broiler, Aurora ovens and sad iron heaters are illustrated and described. There is also presented a telegraphic code for ordering goods by wire and a price-list. The company state that since their catalogue was placed in the hands of the printers they have concluded to add a high nickel plated shelf to their regular high gasoline stoves.

Southard, Robertson & Co., Water street and Peck slip, New York City, are distributing circulars of their Columbus and Waldorf ranges. The former is a six-hole stove for coal or wood and embodies the modern features. It is sold with ornamental cabinet base, or with plain bottom, having a wide hearth and high legs, to which a fancy leg skirting can be bolted. The oven in the various sizes measures 15 x 15 x 10¼ inches. The Waldorf is made heavy and durable, has a large ventilated oven, patent extension flue strip for regulating the heat and draft in the bottom of the oven, extra heavy covers, patent oscillating grate, large ash pan and patent oven door opener. It is made in portable form or for brick work and with right or left hand fire box. The oven measures 20 x 20 x 12½ inches and the top surface of the stove 28 x 38 inches.

Charles B. Hotchkiss, for a long time manager of the New York department of the Barstow Stove Company, will during the ensuing year look after the interests in the city of New York and adjacent territory of the Danville Stove & Mfg. Company of Danville, Pa.

The Magee Furnace Company of Boston, Mass., are the assignees of a patent granted December 12 to Frank A. Magee of Chelsea, Mass., for an improved type or form of water front for use in connection with stoves or ranges. The location of the water front is changed to some extent from that usually employed, so that a relatively small section of its fire pot wall can be touched by the fire in process of combustion. In connection with the water front or back are one or more extensions into the fire pot upon a line with the surface of an ordinary fire, these projections being hollow and connected with the cavity of the water front, and are claimed to materially increase its heating capacity. The extensions may be cast with the front or made independdently and united by screw connection.

The Matthews Mfg. Company of Worcester, Mass., have issued, under date of January 8, an announcement to the stove trade calling attention to the fact that the stove knobs which they manufacture are made under patent No. 475,880, granted May 31, 1893, to Ambrose T. Matthews. This is said to be the latest invention of Mr. Matthews, and differing materially from anything heretofore invented in the line of stove knob bases, covering a very important point, that of economy in cutting stock, thereby reducing the cost of production. The company also state that they own the right to manufacture under the Bennett patent issued March 20, 1883, and the Matthews patent dated December 21, 1886, which enables them to produce the best stove knob in the market at the lowest possible cost without infringing on any other make. The announcement is also made that satisfactory settlement was made for all infringing knobs sold by the company last year, which carries with it the right to use the same. Catalogues of the company's stove knobs and hinge pins are being mailed to the trade by the company's agent, Henry Gleason of New York.

E. D. Purves, representing Southard, Robertson & Co. of New York, will call on the trade in New Jersey, Pennsylvania and the South in the interest of the house.

The Howard Stove Company, Beaver Falls, Pa., have made a voluntary reduction in the rent of houses occupied by their workmen. Rents are reduced $3 per month.

The Wrought Iron Range Company of St. Louis, Mo., are sending out a little pamphlet of pocket size relating to their exhibit at the World's Columbian Exposition, on which they were awarded six gold medals. The front cover of the pamphlet is a *fac-simile* of the official ribbon issued by authority of the World's Columbian Exposition and indicates for what the premiums were awarded. The list covers family ranges, hotel ranges, charcoal broiler, steam table and carving table, malleable iron water back with safety valve, and general display of hotel and family ranges. The pamphlet illustrates and describes these goods and presents a bird's-eye view of the company's factory at St. Louis, and also their branch works at Toronto, Canada.

Robert White, who died at Utica, N. Y., recently, aged 55 years, was an old employee of Rathbone, Sard & Co., Albany, N. Y. The remains were accompanied to the latter city by a delegation of Utica molders and the Molders' Union of Albany attended the funeral.

The Buckwalter Stove Company of Royersford, Pa., resumed operations on Tuesday, January 9, after a brief shut down.

The Kernan Furnace Company of Utica, N. Y., have filed with the Secretary of State at Albany a certificate of the increase of their capital stock from $20,000 to $50,000.

Rathbone, Sard & Co., Wabash avenue and Randolph street, Chicago,

will shortly issue their vapor stove catalogue for this season. Their line of such stoves will this year be more extensive than ever. They not only propose to continue in the vapor stove business but expect to secure a larger share of the trade than in past years. Improvements have been introduced in their line which they believe will be appreciated by their customers.

THE MICHIGAN BRYCE FURNACE COMPANY have been organized at Grand Rapids, Mich., to manufacture and sell the Bryce self-feeding warm air furnace in that State. A. H. Blanchard is president; S. T. Bryce is vice-president, and A. M. Kuhn is secretary and treasurer.

GEO. N. PICKSTOCK, who for the past 11 years has represented J. S. & M. Peckham in Western New York, has connected himself with the Syracuse Stove Works, Syracuse, N. Y., to represent them in the territory above mentioned. Mr. Pickstock has won for himself many friends in the trade, and the Syracuse Stove Works congratulate themselves on acquiring so popular a representative to show their line of Welcome stoves and ranges.

THE J. F. PEASE FURNACE CO. of Syracuse, N. Y., have discontinued their agency at 82 Lake street, Chicago. Arrangements have not yet been made for a new agency, but it is understood that the company have no intention of withdrawing from the Chicago field.

THE following salesmen will represent the Syracuse Stove Works, Syracuse, N. Y., for the year 1894: R. Daggett, C. H. Ingham, C. B. Hill, E. A. Wilbur and G. N. Pickstock.

A tremendous explosion occurred on the night of January 9 at the works of the Portland Electrical Zinc Company, Fish Point, Portland, Maine. The general manager, Parker Choate, was badly burned and otherwise injured. The damage to the works is estimated at $5000.

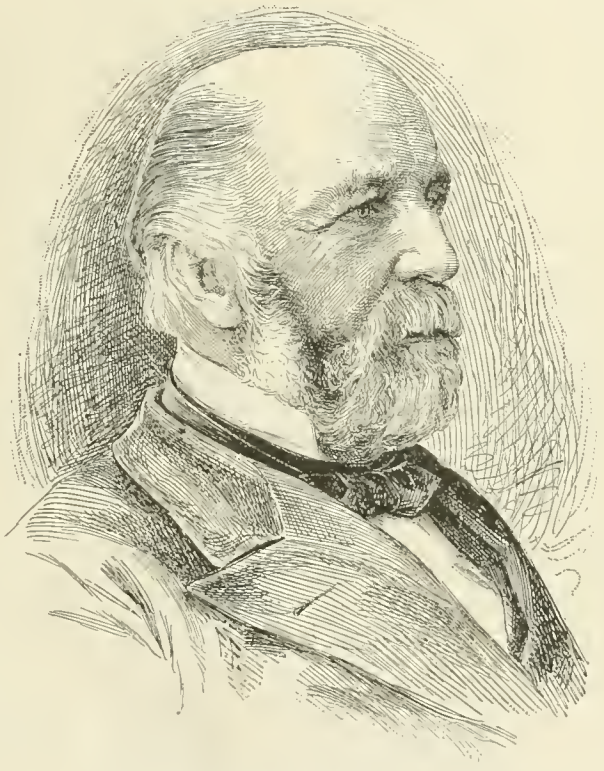
Darius Davison, the naval architect, is, it is said, working on the plans of a ship that is, he says, to be the coming Atlantic liner. The vessel is to be 1000 feet long, 80 feet wide, 70 feet in depth, and to have a displacement of 45,000 tons. She will be moved by four propellers driven by a 50,000 horse-power engine, and the distinctive feature of the ship is a projecting bow and stern, each 150 feet long, an entirely new departure in marine architecture.

The Alps are to be pierced by another railway tunnel. This time it is the Simplon that is to be attacked, by a company recently formed in Switzerland for the purpose. The work is estimated to cost $15,000,000 and to occupy five and a half years.

Sidney Shepard.

As announced in a recent issue, Sidney Shepard, whose portrait we present herewith, died at his residence at New Haven, Oswego County, N. Y., on the morning of December 26. Mr. Shepard was among the oldest and most prominent citizens of Buffalo, he having moved to that city in the spring of 1836, when he was 22 years of age. The business which he started then has since developed into the present houses of Sidney Shepard & Co. of Buffalo, and C. Sidney Shepard & Co. of Chicago.

Mr. Shepard was born at Cobleskill, Schoharie County, N. Y., September 28, 1814. He was descended from Ralph Shepard, who came to this country from England in 1635, while on the maternal side his ancestor was William Hamilton, who came from Glas-



SIDNEY SHEPARD.

gow in 1668. Mr. Shepard's father, who was a physician, was well known throughout Schoharie County, and his grandfather, Hosea Hamilton, was a surgeon in the Revolutionary War and a personal friend of General Washington. At the age of 14 years he left school and took a position as a clerk in a hardware store at Dansville, N. Y. He subsequently removed to Rochester, where he remained until the spring of 1831, when he associated himself in business with a brother in Bath. This enterprise proving successful enabled him to remove to Buffalo in 1836 and purchase a hardware store and found the business which still bears his name. He subsequently established the sheet metal ware manufactory on Clinton and Union streets, and in 1849 became the owner of the Shepard Iron Works, on Ohio street, Buffalo.

Mr. Shepard resided in Buffalo and continued in the active management of his affairs until 1865, when he handed over the control of his Buffalo interests to his partners, and after spending several years in foreign travel returned to this country and purchased the old family homestead of his wife, at the village of New Haven, where he afterward resided.

All of the business enterprises of Mr. Shepard were successful in an eminent degree, and the concerns with which his name is associated attained a very high commercial standing. Mr. Shepard, however, was not content with these achievements and sought a wider field for the exercise of his business ability. He was among the earliest to put faith in the possibilities of the electric telegraph and invested largely of his wealth in the stock of the Western Union Telegraph Company. He was a director of that company until within a few months of his death, when failing health compelled his resignation. He was also prominent in railroad affairs, and was a director in the Mobile & Ohio and Jersey Central roads, in which he held large interests.

Mr. Shepard had been a member of the First Presbyterian Church of Buffalo for over 50 years. He was married in 1851 and his widow and two sons, Charles Sidney and Ralph Hamilton, survive him. Mr. Shepard gave away much during his life, though few, even of his most immediate associates, were acquainted with the extent of his benefactions, for they were bestowed in such a way that they were often known to none but the recipients, and at times even they were not made aware of the source of the gifts. He was not an indiscriminate giver, but exercised the same care and judgment in his charity which he applied in his business affairs. Regarding the personal character of Mr. Shepard, in business and in private life, we will quote the words of one who knew him: "Though Mr. Shepard withdrew some years since from active interest in the Hardware and Metal trades, yet the impress which he made upon all who were associated or acquainted with him during the many years that he was prominently identified with these lines, is a very lasting one. He possessed an exceptional genius for organization and great executive ability. He was a close student of events and had the elements of progressiveness and conservatism happily united in his character. His adherence to the strictest principles of integrity was rigid and unswerving. His disposition was genial and inspiring and his memory will be treasured by all who enjoyed the privilege of knowing him."

A motion has been brought forward in the English House of Commons asking that a committee be appointed to inquire into the management and expenditure of the British section of the Columbian Exposition. Assertions are made that the signatures on certain documents were forged.

THE matter of heating the Court House, at Delano, Minn., is being considered by the local authorities.

TRADE REPORT.

The Iron Market.

Pig Iron.—The sensation of the week in the New York market has been the announcement of a reduction of prices on the part of the Lowmoor Iron Company of Virginia, whose Iron ranks among the highest in quality in this and in the New England markets. The prices announced are $12.50 for No. 2 and $13 for No. 1 Foundry. The Lowmoor Iron Company have taken this step in defense of their trade, but it is not proposed to contract ahead heavily at the low figures made. As yet the other leading makers of the equivalent highest grades of Northern Iron have not followed suit, nor are the facts stated yet so generally known that the producers of the cheaper grades have had a chance to take action. It is probable, however, that the course pursued will bring matters to a crisis, at least so far as this and tributary markets are concerned. We quote: Standard brands, $13 @ $14 for No. 1; $12.50 @ $13 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $13.50 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12 for No. 3; $11.50 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

Our advices from Philadelphia indicate that, in the Pig Iron market sellers are firmer on good brands of No. 1 Foundry, which is relatively in small compass. Additional furnaces are blowing in, however, and as the owners intimate their willingness to meet the market, the chances for any material improvement in prices are thought to be not very strong. Lower grades are in full supply, with prices somewhat irregular and in spots a little weak. Buyers could be found for good sized lots nevertheless, providing that $11 @ $11.25 would be accepted for good all Ore Irons, Philadelphia delivery, or at less than $11 for an ordinary grade. As a rule, bids are about 50¢ below sellers' ideas, so that there is not much actual business to report, and while they may yet come together on a compromise, the question for the present is still undecided. General quotations for seaboard deliveries are about as follows:

No. 1 Foundry	$13.75 @ $14.25
No. 2 Foundry	13.00 @ 13.25

In the Chicago market inquiries for Coke Iron have been much more numerous since last report, covering large and small quantities, and coming from all classes of consumers. Sales of small lots have also increased in number. There is, however, no immediate prospect of an improvement in prices, as competition is keen on all orders coming up. Lake Superior Charcoal is extremely quiet, and transactions are confined to small lots only. Bankrupt stocks are being offered low and thus cause reports which are current of a decided break in makers' prices, but they insist that they have not found it necessary to yield, and report sales at about the prices given in our quotations. Quotations are now as follows for cash:

Lake Superior Charcoal	$15.30 @ $15.50
Local Coke Foundry, No. 1	13.00 @ 13.50
Local Coke Foundry, No. 2	12.50 @ 12.75
Local Coke Foundry, No. 3	12.00 @ 12.50
Local Scotch	13.50 @ 14.00
Ohio Strong Softeners No. 1	15.50 @ 16.00
Southern Silvery, No. 1	@ 13.75
Southern Silvery, No. 2	@ 13.25
Southern Coke, No. 2	11.90 @ 12.15
Southern Coke, No. 3	11.40 @ 11.65
Southern, No. 1, Soft	11.90 @ 12.15
Southern, No. 2, Soft	11.40 @ 11.65
Tennessee Charcoal, No. 1	16.00 @ 16.50
Tennessee Charcoal, No. 2	@ 15.00
Alabama Car Wheel	18.00 @ 18.50
Jackson County Silvery	16.00 @ 16.50
Other Ohio Silvery	15.00 @ 15.50

The past week in Southern markets shows little change over the preceding one, there being scarcely more than a car lot trade in Pig Iron for current delivery, and some of the furnaces are becoming anxious for customers, but they are too careful to urge stocks when there is no disposition to buy. The gloomy reports which come from Pittsburgh and other districts have a detrimental effect upon our market, and there seems to be a tacit understanding between buyers and sellers that prices shall be nominally unchanged for the present. Quotations are as follows:

Southern Coke, No. 1	$11.75 @ $12.00
Southern Coke, No. 2	10.75 @ 11.00
Southern Coke, No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—The best statistical showing made up to the present time has failed to stimulate business in the slightest degree. With business dull and tariff uncertainties perplexing, prices have followed in the wake of the fluctuations in the London market, despite steady, although slow, depletion of stocks in first hands on this side of the Atlantic. As against 20.50¢ @ 20.60¢ quoted a week ago, cash prices for 10-ton or larger lots are 20.20¢ @ 20.25¢ at the present time. The foreign depreciation keeps the American price below the import cost, on the basis of lowest London quotations, and little Tin has been landed except in bond. The available supply at current quotations is comparatively moderate in consequence, but apparently more than sufficient to satisfy imperative trade requirements, the jobbing demand being extremely light, and stocks in dealers' hands of fair proportions. Prices for small lots rule generally at 21½¢ @ 22¢ ℔ lb for Straits Pig, with ¼¢ @ 1¢ advance on Bars.

Copper.—Business in Copper is virtually at a standstill. No improvement has taken place in the demand for any variety of this metal, and dealings have been confined almost wholly to small lots for prompt or immediate future delivery. Were it not for the remarkably large quantity of Copper exported last year the market would doubtless show poorer form. As it is, there are evidences of rather soft undertone and reasons to suspect that current production is running considerably ahead of deliveries. Still the accumulation is causing no unusual pressure to sell and values hold remarkably steady in the face of the dull condition of trade. Lake Superior Ingot is offered by several sellers at 10¼¢, and in remote instances quotations of as low as 10.15¢ @ 10.20¢ have been made. Jobbing prices for small lots of Ingot and Sheet Copper show no change.

The Bureau of Statistics returns give exports of Copper during the 11 months ending November 30 as follows:

	1893.	1892.
Ore.	Tons.	Tons.
To United Kingdom	39,344	44,796
To Germany	1,043	1,462
To other Europe	....	168
Totals	40,407	46,426
Ingots, Bars and Old.	Lbs.	Lbs.
To United Kingdom	33,6 6,042	2,874,969
To Germany	15,796,167	5,699,940
To France	25,259,573	6,756,681
To other Europe	44,186,789	10,913,996
To other countries	723,748	99,206
Totals	119,602,319	26,344,792

Pig Lead.—Through a reduction in the price to 3.20¢ sales of about 500 tons were made at 3.20¢ during the early part of the week. Additional lots were subsequently offered at the same rate, but buyers responded very feebly, and later requests for bids of 3.15¢ were disappointing as an inducement to purchase. The market has thus shown weaker form than at any time since prices broke below the 3.50¢ mark. Consumers are very indifferent, and jobbers only take such an amount of Lead as will keep their stocks in satisfactory shape. The latter look for no revival of interest in this metal until some better prospects open out in the building trades. Prices for jobbing quantities of American Pig are quoted at 3¾¢ @ 4¢ ℔ lb. There is no change in quotations for Lead Pipe or Sheet Lead.

Spelter.—Lower prices are again to be recorded. Ordinary Western brands

have been sold at 3.50¢ @ 3.55¢, and the better sorts have commanded merely the ordinary premium. It does not appear that the concessions made have expedited business in the slightest degree. To the contrary, the market, besides showing weakness, is surprisingly dull, with nothing in the way of surroundings indicative of any decided change for the better in the immediate future, since European as well as home markets have shown a downward tendency. Jobbers' price for Western Spelter in small lots is 4¼¢ ₱ lb, with the usual premium on fancy brands.

Tin Plate.—The revival of demand for Tin Plates which in ordinary times develops after the first week in January has as yet failed to materialize, although spot sales of small quantities have been rather more numerous and a little more inquiry is noted by jobbing houses. Consumers take only such goods as absolute wants dictate and manifest little interest in forward deliveries, although the latter have, in some instances, been offered at specially low prices for February and March shipment. Prices all along the line are somewhat soft, and for good sized orders buyers can, as a rule, command a material shading of quoted rates. The trade is, in a word, in a condition of restless uncertainty, awaiting the fate of the new tariff bill. The general aspiration is that whatever changes are made in the Tin Plate duty may be made quickly, as otherwise business will continue at the present low level, if it does not go from bad to worse.

A London cable dispatch to *The Iron Age*, dated January 10, reports that the British Tin Plate market continues quiet. Inquiries are few and orders are limited. Many American offers have been refused owing to lowness of limits at which buyers seem disposed to enter large contracts. Liverpool quotations are given as follows:

IC Charcoal, Alloway grade	12/3 @ 12/9
IC Bessemer Steel, Coke finish	11/3 @ 11/6
IC Siemens " " "	11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20	11/3 @ 11/6
Charcoal Terne, Dean grade	10 9 @ 11/

A later cable message to Bruce & Cook reports that the quarterly meeting at Birmingham on Thursday, January 11, was poorly attended. Buyers' views were much below those of sellers as to prices, consequently little business was done.

THE AUTOMATIC FAUCET COMPANY have been incorporated to manufacture Automatic Faucets in Brooklyn, N. Y. The directors are Max Ruben, Louis Sanders and Jas. L. Jensen, of that city. Capital, $5000.

WATERBURY BRASS COMPANY, Waterbury, Conn., and 296 Broadway, New York, announce, under date of January 1, that they have just completed extensive brass rolling and wire mills to replace those destroyed by fire in January, 1892. They have placed in these mills new and improved machinery, which will enable them to meet the requirements of the trade on manufactured goods.

Chicago Report.

Scrap.—The supply of Old Iron and Steel is much more abundant and prices are very weak, with dealers not inclined to buy anything but bargains. Dealers furnish the following list of nominal buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	7.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3⅛¢
Pipe Lead	....	2⅛¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—Trade continues extremely dull and prices are cut in the effort to move stocks. Carload lots of 12 net tons or over are still nominally quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

THE SCOTTDALE IRON & STEEL COMPANY, LIMITED, of Scottdale, Pa., manufacturers of Iron and Steel Sheets, are adding two new Sheet mills to their equipment and buildings to cover same. The addition of these two new mills requires the erection of two additional Sheet heating, two Bar heating and one annealing furnace, which are now under construction. This firm are also putting in one of Warren Webster & Co.'s feed water heaters and purifiers of 1500 horse-power. The excavating has been completed and the materials are now on the ground for the foundations. New foundations are also being put in under the large Sheet mill engine and fly pit wheels, and a new wrought iron shaft is being added to one of the fly wheels to replace an old one. Other necessary repairs are also being made.

A COMPANY has been organized at Portland, Maine, to manufacture metal goods, with $35,000 capital stock. O. D. Thomas is president and G. W. Jeffrey treasurer.

CONDITION OF THE

Hardware Trade.

IT IS as yet too early in the year to expect a marked improvement in the volume or the tone of business, but it is pleasant to note the active preparations which are being made for the trade of the coming months, and the disposition to take a cheerful view of things. Reports indicate that mills and factories are starting up, showing not only that the manufacturers are preparing for business, but are giving employment to operatives and thus setting in motion the wheels of trade in many diversified fields. Travelers are also being sent out, as jobbers and manufacturers are desirous of securing orders, thus contributing their part toward the resumption of normal activity. It is, of course, too early as yet for them to be sending in many orders, but we are advised that they are beginning to be heard from and in a fairly satisfactory manner. Notwithstanding the complaints which were made of trade in the past year, and especially of the last half, it is pleasant to note that the volume of business in many cases is reported as comparing favorably with ordinary years, and a great majority of concerns are doubtless in a position to push energetically for success in the year on which we have entered. It is also an excellent sign that there is a disposition to take a cheerful view of the situation, and while not entertaining unreasonable expectations in regard to the volume of business for the next month or two, the trade are disposed to avail themselves of the opportunities presented and to move with enterprise in the prosecution of their interests. This is certainly not the time for reckless expansion or speculative buying or for the abandonment in any way of the careful, conservative policy which has characterized the trade for some months, but it is desirable that the trade at large should contribute their part and do what they can in the direction of promoting the general prosperity. To this end it will be well for the jobbing trade in their larger purchases and for the retail trade, whose orders, though separately small, aggregate an enormous volume, to avoid the mistake of undue caution, and begin to buy more freely. It would seem that the time has come for the merchants who are in a financial condition to do so to replenish assortments which have become too much depleted and broken, and for each to cultivate his own field, whether it be large or small, so that goods may soon be moving with old time freedom.

Advices from Chicago.—Some of the jobbing houses now have their salesmen out on the road and are feeling rather encouraged by the orders thus early received for seasonable goods for spring delivery, such as Screen Doors, Wire Cloth and other

articles in the same category. The retailers are reported to be carrying very light stocks of all classes of goods, but are buying only to the extent of their immediate wants. Wire Cloth seems to be in considerably better condition than last year at this time. The price was then $1.35, but is now $1.50 on small lots or $1.45 for 25 rolls and upward. Manufacturers of Wire Cloth have adopted a new policy, and now only allow the Chicago rate of freight. Last year they delivered to the Missouri River. This change places Chicago jobbers in a better position for the Western trade. Collections are good and money seems to be more plentiful among retailers. Heavy Hardware jobbers report better inquiries from their customers, but the volume of business is still light. They consider prospects encouraging for a better trade in a short time.

Notes on Prices.

Wire Nails.—There are evidences of a slight quickening in the demand for Wire Nails, and a fair number of orders are being received by the manufacturers from both the larger and the smaller trade. A new year having been entered upon, and the business of 1893 closed, there is a disposition to prepare for future business, and the trade are accordingly replenishing their stocks. The mills are pursuing a conservative policy and avoiding undue accumulation of Nails, some of them being stopped for the present and others diminishing their output considerably. Prices remain as at the last report, the market being represented by the quotation of $1.10 for carload lots at mill, a figure from which a concession of 5 cents is sometimes made on attractive orders. Small lots from store are held at $1.35 to $1.40.

Advices from Chicago.—It would appear that $1.15 Chicago is now the bottom price on factory lots of Wire Nails. The manufacturers who have been disturbing the market by low offers for spot cash made no impression, and as quite a number of factories are shut down, the others are able to maintain their prices. The active companies are well supplied with orders and are in receipt of steady inquiries, which promises considerably better business in the near future. They are quoting $1.20 Chicago on ordinary lots. Jobbers report a growing demand for carload lots of Wire Nails from their customers. They are discouraging this business, however, as they do not think it good policy to overstock the retail trade. They quote, in a regular way, $1.30 to $1.35 for small lots from stock.

Cut Nails.—The Cut Nail manufacturers are in general adhering to the low prices with which December closed, the quotation of 90¢ in carload lots at mill being a representative one, from which concessions are made in some cases. The demand is only moderate, but some orders are being received. Small lots from store, in New York, are held at $1.20 to $1.25.

Advices from Chicago.—An improved demand is noted for Cut Steel Nails and manufacturers are pleased at the receipt of orders from sections which have for some time been handling Wire Nails exclusively. They expect to sell more Cut Nails this year than last. Prices on factory lots are maintained at $1.15 to $1.20, Chicago. Small lots from stock are quoted at $1.25.

Barb Wire.—The Barb Wire market is in substantially the same condition as at our last report. The demand is moderate and prices are somewhat uneven. Galvanized Four Point may be quoted reguarly at $2.05 at mill, with 5 cents off in carload lots. Painted at mill is held at $1.65, with 5 cents off in carloads.

Advices from Chicago.—The Barb Wire trade is rather quiet in this immediate section, but heavy business is reported to be under way in the Southwest and especially in the Indian Territory. Prices of carload lots of Galvanized are $2.25 to $2.30, Chicago, while jobbers ask $2.40 for small lots from stock.

Curry Combs.—The American Curry Comb Company, Troy, N. Y., and 33 Chambers street, New York, have issued a supplement to be attached to their catalogue of January 1, 1893. It represents a number of recent additions to their line of Curry Combs, illustrations of which are given. The company have also been issuing revised quotations on their entire line.

Very nearly all the leading manufacturers are acting in concert in the matter of prices, and as a result most of the low quotations which were outstanding have been withdrawn, and the market is thus somewhat higher and characterized by a decidedly firm tone.

Pattern Dowels.—Standard Pattern Dowels, manufactured by W. S Hawker, Broad and Adria streets, Philadelphia, Pa., are sold at a discount of 25 per cent. from the following list:

Inch.	Per doz.
1/4 Dowels	$0.35
3/8 "	.55
1/2 "	.75
5/8 "	.90

Curling Irons.—The Columbian Folding Curling Irons, recently introduced and manufactured by the American Curling Iron Works, 72-74 Market street, Chicago, are sold at $18 per gross net.

Milk Can.—The S. & P. Milk Can, manufactured by the Stuart & Peterson Company, Burlington, N. J., recently placed on the market, is sold to the retail trade at $6 net each, from which price a discount is made to jobbers.

Sheet Zinc.—Revised quotations on Sheet Zinc have been issued by the Matthiessen & Hegeler Zinc Company, La Salle, Ill., under date January 1. The price of $4.50 per 100 pounds is announced for Sheet Zinc in 600-pound casks of the thicknesses between Nos. 9 and 15, inclusive, of the widths between 32 and 46 inches, and of the lengths between 84 and 90 inches. The following are the extras in cents per 100 pounds:

Nos.	5	6	7	8	9	10	11	12	13	14	15
32 to 40 x 84	55	35	20	05	.....	.....	.....	.....	.....	.....	.....
32 to 46 x 84 to 90	....	....	....	....	none	none	none	none	none	none	none
52 x 84	....	....	170	70	60	50	35	35	35	35	40
50 x 84	..	....	110	55	40	25	15	15	15	20	20
48 x 108	...	....	90	65	55	35	15	15	15	20	20
48 x 96	....	....	75	35	30	15	15	15	15	15	15
48 x 84	190	100	60	20	15	05	05	05	05	05	05
36 x 108	120	105	55	30	25	15	15	15	15	15	15
36 x 96	100	50	30	20	15	05	05	05	05	10	10
30 x 84	80	50	40	20	10	10	10	10	10	10	10
28 x 84	90	60	45	25	20	20	20	20	20	20	20
26 x 84	105	70	55	30	25	20	20	20	20	20	20
24 x 84	115	80	65	15	10	05	05	05	05	05	05

Bright Wire Goods.—The market for Bright Wire Goods continues an open one, with a decidedly active competition between the different manufacturers. As a result, prices have been crowded down until they have reached a figure which is referred to as lower than the goods have previously touched.

Tacks.—The Tack market is in a better condition than for a long time. In casks of 100 pounds of the usual numbers 30 cents extra per 100 pounds is charged and other charges for small lots are as before. The following revised discounts are announced:

Discounts.	First Class. 15 600-pound casks, and upwards	Second Class. 10 to 14 600-pound casks.	Third Class. 5 to 9 600-pound casks.	Fourth Class. Under 5 600-pound casks.
Special	8 per cent.	8 per cent.	8 per cent.	8 per cent.
Cash with order	3 "	3 "	3 "	3 "
Quantity	3 "	2 "	1 "	0 "
	14 "	13 "	12 "	11 "

All discounts are computed straight when money accompanies the order. The quantity discount is added to the special discount in all cases. If remittance is received within ten days of

date of invoice the cash discount will be only 2 per cent. instead of 3 per cent. and not computed straight. Each order is strictly subject to the quotation of the class to which it belongs.

Shrinkage Rule.—The Improved Shrinkage Rule, manufactured by the Thompson Hardware Company, Lowell, Mass., is sold at $2.50, net, each.

Glass.—There is no change in the condition of the Glass market, trade being of a from haud to mouth character. Factories are making only enough Glass to supply demanda and are not stocking up to meet orders during the annual summer shut down, as is usual at this aeason of the year. Local business with jobbers is quiet, a condition of trade not unexpected at this season of the year. Architects are reported as being engaged on a large amount of prospective building, which, if carried through to completion, will create a large demand for Glass. Plate Glasa factories are starting up, with reduction of wages in most cases, some having orders in hand sufficient to keep them employed for some time. Quotations by jocal jobbers are from 80 and 10 and 5 to 80 and 20 per cent. discount for single strength in 100-box lots, and 85 per cent. discount direct from factory. French Window Glass is quoted at 75 and 10 and 5 to 80 and 5 per cent. discount. Quotationa from Western Window Glass and Plate Glass factories remain unchanged, as quoted in our last issue.

Old Metals.—The local market for Old Metals continues dull, with prices on the same low level at which they have now remained for many weeks. Even these low prices are no inducement to any one not in absolute need of material, and dealers are consequently more or less hampered with stocks, which they are not inclined to supplement. The following quotations represent about the prices paid in New York for moderate quantities:

Heavy Copper	℔ lb		7¢
Light and Tinned Copper	℔ lb		6½¢
Heavy Brass	℔ lb		5¢
Light Brass	℔ lb		4½¢
Lead	℔ lb		3¢
Tea Lead	℔ lb		2¾¢
Zinc	℔ lb		2½¢
No. 1 Pewter	℔ lb		14¢
No. 2 Pewter	℔ lb		6¢
Wrought Scrap Iron...℔ gross ton		$7.00 @	$8.00
Heavy Cast Scrap...℔ gross ton		8.00 @	9.00
Stove Plate Scrap...℔ gross ton		4.00 @	5.00
Burnt Iron, ℔ gross ton...		2.50 @	3.00

Old Rags, Paper, &c.—No marked improvement in the demand for this material is noted. The market remains quiet and prices more or less nominal, the following being approximately those at present ruling in New York:

No. 1 White Rags	℔ lb	3¼ @	3½¢
No. 2 White Rags	℔ lb	2¼ @	2½¢
Mixed Rags	℔ lb		¾¢
Blues and 3ds	℔ lb	1 @	1¼¢
Hard Sized White Shavings	℔ lb	2¼ @	2½¢
No.1 White Book Shavings	℔ lb	2 @	2⅛¢
No.2 White Book Shavings	℔ lb	1 @	1⅛¢
Light Book Shavings	℔ lb		¾¢
No. 1 Mixed Shavings	℔ lb	¾ @	1 ¢
No. 2 Mixed Shavings	℔ lb	½ @	¾¢
No. 1 Printed Books	℔ lb	1 @	1¼¢
Ordinary Mixed Books	℔ lb	½ @	¾¢
Newspapers	℔ lb	½ @	3-5¢
No. 1 Manila Paper	℔ lb	1 @	1⅛¢
No. 2 Manila Paper	℔ lb	⅝ @	¾¢
Bogus Paper	℔ lb		½¢
Common Paper	℔ lb		⅜¢
Straw Chips	℔ lb		⅛¢
Binders' Clippings	℔ lb	½ @	⅝¢
Jute Butts	℔ lb	1⅞ @	2 ¢
No. 1 Jute Bagging	℔ lb	1 @	1¼¢
Mixed Bagging	℔ lb	¾ @	1 ¢
No. 2 Bagging	℔ lb	½ @	¾¢
Hemp Twine	℔ lb	2 @	2¼¢
Manila Rope	℔ lb	2¼ @	2½¢
Jute Rope	℔ lb	1½ @	1¾¢
Mixed Rope	℔ lb	¾ @	⅛¢

Old Rubber.—Market narrow and prices irregular. The following quotations are those nominally ruling for Old Rubber delivered in this city:

Car Springs, ton lots, ℔ lb.	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.03
Rubber shoes, less than carloads, ℔ lb.	0.02¼ @	.03⅛
Large Hose, ℔ ton	@	9.00
White Wringer Rolls, ℔ lb.	@	.04¼
White Syringes, ℔ lb.	@	.05

Trade Notes.

McLane & Schanck, Lineaville, Pa., send us a four-page circular of a Maple Evaporator which they manufacture for the trade. It is said to be so constructed as to require little coal, and is cheap and durable. The circular presents a general view of the device, together with instructions for setting. Another feature is a price-list of the Evaporators together with Sap Buckets Syrup Cans, Gathering Tanks, &c.

Among the corporations chartered at Harrisburg, January 5, was the Merchant Company, incorporated in Philadelphia, to manufacture Iron or Steel, with a capital stock of $400,000. The incorporators are Clarke Merchant, Henry W. Merchant, Leslie Chase, Dallas Sanders and J. Estelle Merchant, all of Philadelphia.

The Britton Rolling Mill Company, Cleveland, Ohio, issues a notice to the trade emphasizing the fact that it is not their company that has changed its name. They say that the Britton Rolling Mill Company is still the Britton Rolling Mill Company, and that it manufactures Iron and Steel Plate, sheared and universal rolled; also Soft Steel Sheets as light as No. 20 gauge.

The Fred. J. Meyers Mfg. Company expect to have their new plant, at Hamilton, Ohio, in full operation by the end of this month. They have two very large and complete buildings with ample grounds and excellent railway connections. The buildings are completely furnished with machinery for the manufacture of their well known line of goods.

The Wainwright Mfg. Company of Boston have transferred to the Taunton Locomotive Mfg. Company, Taunton, Mass., the right to sell and manufacture the goods which they have supplied for several years past. For four years the Taunton Company have manufactured all of their Heaters, Condensers, Expansion Joints and Corrugated Gaskets under a manufacturing contract. They are thus thoroughly acquainted with the various requirements of customers and with the technical and engineering features of the business. The present agents will continue the sale of the goods on behalf of the Taunton Company.

During 1893 the Eagle Iron & Steel Company, Ironton, Ohio, manufacturers of Bar and Sheet Iron and Steel, turned out 11,520 tons of Bars and 1869 tons of Sheets. This is a little less than the average production of this concern for the year 1892.

W. J. Gordon is calling the attention of the trade to his Automatic Body Seamers, Combination Presses and Dies and Can Makers' Tools. A leading feature in the Seamers he is making is the practicability of seaming the bodies of cans in one operation. One of these Seamers has just been shipped to Bayer & Co. of Baltimore.

The Thatcher Furnace Company, 33 Peck slip, New York, publish in this issue a page advertisement, in which they direct the attention of the trade to their specialties, including the Scorcher and Thatcher Hot Air Furnaces.

From the Cincinnati *Inquirer* of January 7 we learn that the name of F. H. Lawson has been canvassed as a Republican candidate for Mayor. Mr. Lawson is a member of the firm of F. H. Lawson & Co., the well-known Tin Plate dealers, and is spoken of in very high terms.

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Metal and Miscellaneous Prices.

CHICAGO, JANUARY 11, 1894.

Tin—
Straits pigs .....23¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Mely'n Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allawny Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100℔	.5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
X, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Kansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00
Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20	$7.25
IX, 10 x 14, 12 x 12, 14 x 20	0.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal, extra, IC, 14 x 20	7.25
Merlon, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$8.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—
Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 6-10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3-10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5-10¢
27	℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality..dis.70&7½@10%

Copper—
Ingot.

Lake.....12¢ @ 12½¢
Casting Branda.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 30%.

Copper Bottoms.

Discount, 30%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu.	.35¢
Plain, above 3 inch	.45¢
Plain, 5-16 inch	.45¢
Plain, ¼ inch	.60¢
Plain, 3-16 inch	.$1.00
Plain, ⅛ inch	.$1.50
Fancy Tubing, Brass, to No. 20 incl	.43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass	

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 ℔ casks.....5 ¢
300 ℔ casks.....5½¢
Loose sheets.....5½¢

Lead—
Soft Pig Lead.....3¾¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12¢ @12½¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	50½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	57½&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—
Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.35 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*
Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ lb, 2 ¢
" " Brown	℔ lb, 1½¢
" " Purple	℔ lb, 2½¢
" Ground in oil, B. Red	℔ lb, 6½¢
" Ground in oil, Red	℔ lb, 6½¢
" Ground in oil, Brown	℔ lb, 6½¢
" Ground in oil, Purple	℔ lb, 6 ¢
Linseed Oil, Boiled, in bbls	48¢
Linseed Oil, Raw, in bbls	45¢
Mineral Paints	2@4¢
Orange Mineral	9¾¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	84¢
Spirits Turpentine, in bbls., ℔ gal.	35½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, JANUARY 12, 1894

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal (guaranteed over 94% pure Aluminum), in ton lots..... ℔ lb, $0.70
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ lb .75
Lots less than 1 ton, 10¢ ℔ lb additional.

Antimony—
Cookson..... ℔ lb, 10¾¢@11¢
Hallett's..... ℔ lb, 10¼¢@10½¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per lb.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5 16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—
3¢ ℔ lb more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive	17¢ ℔ lb
Over 3½ to 5 inches inclusive	18¢ ℔ lb

Extra Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive	18¢ ℔ lb
Over 3½ to 5 inches inclusive	19¢ ℔ lb

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%
See also *Elbows and Shoes; Eave-Trough Miters; Strainers. Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢

Planished......net

Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.... 60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—
Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ lb, 2.70	3 ¢
Nos. 17 to 20	℔ lb, 2.80	3.10¢
Nos. 21 to 24	℔ lb, 2.90	3.20¢
Nos. 25 and 26	℔ lb, 3	3.30¢
No. 27	℔ lb, 3.10	3.40¢
No. 28	℔ lb, 3.15	3.50¢
American B. B.	℔ lb, 4¢@4¼¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ lb, 11¾@12¼¢
Patent Planished....℔ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ lb, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70&5@70 &10%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—
Lee's.....33⅓%

Lead—
American Pig.....3¾¢@4¢
Bar.....4½¢
Pipe.....6½¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3½¢ ℔ lb.

Metal Exoanded—
Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2½

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, January 20, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

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PITTSBURGH..... Room 509 Hamilton Building.
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CINCINNATI.....Rooms 22-24 Pickering Building
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

The Index of *The Metal Worker*, Volume XL, July-December, 1893, is now ready and may be obtained on application to David Williams, publisher, 96-102 Reade street, New York; or to 220 South Fourth street, Philadelphia; Room 509 Hamilton Building, Pittsburgh; 59 Dearborn street, Chicago; Rooms 22-24 Pickering Building, Cincinnati; Bank of Commerce Building, St. Louis; 146 Franklin street, Boston, and 312 The Cuyahoga, Cleveland.

Instruction in Sheet Metal Pattern Cutting.

Reference was made in *The Metal Worker* of October 28 and November 18, 1893, to the possibility of a class for instruction in sheet metal pattern cutting being added to the trade school of the Pratt Institute, Brooklyn, provided a sufficient number of candidates for membership were forthcoming. It is now gratifying to be able to announce that Professor Richards, of the Pratt Institute, has decided to inaugurate a class for sheet metal work next fall. It was at first proposed to commence the class with the new year, but it was believed that a better start could be made by postponing it to the beginning of the regular Pratt Institute season of 1894-95, as a better attendance could probably be secured at the later date, and the course of instruction could be carried out uninterruptedly through a six months' session. Professor Richards has intimated that he expects to be thoroughly prepared to make an effective start next fall; but he particularly desires that applications from candidates for instruction should be forwarded to him as soon as possible, in order that he may be able to calculate the size of the class for which it will be necessary to arrange. We trust that such of our readers as are interested in this matter, and who desire to obtain the advantages held out, either for themselves or others, will not fail to notify Mr. Richards accordingly at the earliest possible date. Applications should be made, either by letter or in person, to Prof. C. R. Richards, director of the Department of Science and Technology, Pratt Institute, Ryerson street, between DeKalb and Willoughby avenues, Brooklyn, N. Y. Judging from the thoroughness with which other trades are taught in the Institute, we are convinced that the new sheet metal pattern class will prove an equally efficient means of education in that particular handicraft.

Machinery and Hours of Labor.

One of the effects of improved machinery has been a reduction of daily hours of labor in many branches of manufacture. Perhaps a more accurate statement would be that the increased employment of such machinery has rendered it possible to shorten hours of labor without unduly restricting the supply of anything wanted by the population of the world, and, seeing this possibility, labor has demanded and in many instances has obtained the reduction. Whether the effect of the change thus wrought will ultimately prove beneficial or hurtful all round, it is yet too early to determine; but it seems certain that to a great number of workmen who expend the time thus gained in saloons it cannot have been much help to an improved mode of living, or have conduced greatly to their growth in skill in their respective trades. Saloons are bad schools at best; and now that night schools, free reading rooms and libraries are made accessible to most workmen, it would seem that if, as a rule, their desire for a higher plane of life was urgent, the multitudes of saloons that flourish now in all our large cities, and subsist on the patronage of labor would not long continue so prosperous, and that when hard times like the present come, there would not be so many glad to accept as a charity the bread they are unable to purchase.

Western Banks.

An event of considerable importance to the Northwest is the resumption of the Marine Bank, commonly known as the Mitchell Bank, at Milwaukee. The failure of this great institution last summer did more to shatter confidence in the stability of the banks of that section than any other event. It had stood the storms of a half century and was deemed impregnable, having behind it what were popularly supposed to be unlimited resources. When it collapsed there is little wonder that depositors in smaller banks clamored for the immediate payment of their accounts. The great majority stood the shock safely, and since then business has slowly improved until now the conditions are favorable for the reorganization of the most conspicuous victim in the Northwest of the financial depression. The repairing of the ravages of the panic thus proceeds, even though slowly, and times are shown to be steadily growing better.

An Improvement In the Business Situation.

There can be no doubt, says *The Iron Age*, that the tide is turning in the business affairs of this country. From every quarter come indications of a slight improvement, although thus far the iron and metal trades have participated but little in it. Reports from some financial circles prove that money is again beginning to flow into investment channels. It is a well-known fact that municipal and kindred bonds are finding quite a ready sale at fair prices. The effect has already been witnessed in the larger demand for pumping machinery, cast iron pipe and supplies for water works extensions.

A somewhat surprising fact brought out by a number of interviews with the presidents of some of the leading savings banks of New York is that money is flowing back into those institutions. In spite of the widespread distress among the working classes the deposits during December and thus far in January have exceeded the withdrawals, and in some of the large institutions from one-half to two-thirds of the loss of deposits during the runs of the summer have been recovered. Of course, this merely means that the more thrifty among savings banks depositors have regained courage, and are tired of losing interest. Although much cannot be expected for a long time to come from foreign investors, who have been shocked again by such happenings as the Atchison receivership, yet it is true that houses with European connections have had some orders lately for bonds, which have been unsalable for many months.

Manufacturers in the staple lines also note increasing inquiry and are doing a better business. No one claims that the normal demand has even been approached, but the shrinkage has stopped and tentative, timid expansion has begun. No one is sanguine as to the rate of progress which we may attain in the next few months. There are too many adverse influences at work to admit of rapid recovery. But after the long period of trial and disaster it is joyful tidings that the business situation is improving, slight though that recovery may be. Iron manufacturers are generally convinced that the actions of certain concerns in the trade have needlessly pounded values to the present extraordinary level of prices. Has it occurred to buyers and sellers alike how sudden the recovery is likely to be when the ruthless raiders withdraw even temporarily from the field?

THE LETTER BOX.

Fails to Bake on the Bottom.

From W. S., *Guelph, Ontario.*—Will some of the readers of *The Metal Worker* answer this question: We are selling three or four lines of coal and wood ranges, and we find in some cases they will not bake on bottom of oven. We can get a good fire and they will bake on top of oven, but the bottom is quite cool. In some cases we have put in other stoves and they work well. If any of your readers can give us a pointer they will greatly oblige us.

Note.—We hope our readers will embrace the opportunity to give their experiences on the trouble in question. The principle involved in baking is that the air that enters the grate in passing through the coals is heated and with the burning gases must pass to the bottom of the oven with sufficient rapidity to raise the bottom of the oven to a high temperature. If their principal heat is imparted to the top of the oven and lost before it gets to the bottom, naturally, baking cannot be done on the bottom of the oven. The fire is located considerably above the bottom of the oven and the heat has to take an unnatural or downward passage to reach it. This can only be effected by a strong draft in the chimney, drawing the hot gases down to the low point quickly. Just why stoves of similar construction should operate successfully where others have failed cannot be determined, except by a careful study of the small details. A change in the size of the pipe, a more careful connection with the chimney, so that no air can enter into it, or some other similar and apparently slight change might bring a successful result. As a rule, where a stove fails to bake on the bottom, those of long experience endeavor to improve the draft in some way.

Removing Oil from Brass.

From H. R. R., *New York.*—Please advise me through the columns of *The Metal Worker* if you know of a liquid that will remove oil and grease from brass and which is not so inflammable as benzine.

Answer.—We presume our correspondent has thought of turpentine, but there is the same objection to it as there is to benzine, because of its inflammability. We think if he will try a more or less strong solution of ammonia in water he will find it to work satisfactorily. Strong ammonia would be uncomfortable to handle and we believe it has some effect upon brass, though we doubt if it would attack it to any noticeable degree. Mixing it with water, however, would remove this possible danger and make it more conveniently handled and at the same time remove the grease. For that matter any strong solution of alkali would be effective if ammonia is not suitable.

Tempering Gun Springs.

From C. L. M., *Harrisonburg, Va.*—Some time ago the question was asked how to temper gun springs. The following description of my method may prove of interest. I first take the spring to be tempered and fit it in the lock, to see that it fits properly. Then heat to an even cherry red and drop it in water. Next take about four pounds of lead, heat it until it will just burn the shavings that you can scrape from a hammer handle with a knife. They must curl up and burn slowly. Put a piece of wire around the spring and hold it in the lead until the lead chills around the inside of the ladle. Take the spring out and let it cool slowly, and you will have a good, even temper. With a little practice the spring can be given any temper required.

Pipes from Tank.

From D. W. A., *New York.*—The illustration in *The Metal Worker* of December 23, of a wind mill tank of "M. T. C.," Riverside, Cal., shows the overflow going down the outside of the tower, which is tapered. Therefore, the pipe would be on the same angle, which would throw the end of the nipple inside of the tank down, so that the top of the nipple inside of the tank would be lower than the bottom of the nipple at the elbow, and therefore make a trap, as shown in Fig. 2. It is not likely that any air is between A and B in Fig. 1, because your correspondent has had water running through the pipe, and it would never empty below the line A B after once being filled. The reason it runs through the overflow after being started from the house main is that the friction in the 360 feet of pipe is so much that the water rises in the overflow and forces part of the air out by bubbling up through the tank at C. Then, when the tap between the house main and overflow is shut, the water in the overflow would fall down to A, drawing enough of the water over at C to act as a syphon and force the rest of the air down through the pipe and out at B. If a small hole, $\frac{1}{8}$ of an inch or larger, is bored at D, it would allow the air to pass out at any time. If desired, a small pipe could be put in this hole, level with the top of the tank, but I do not think it is necessary.

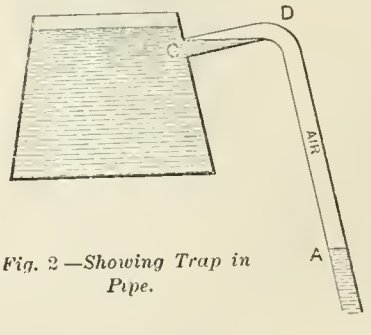
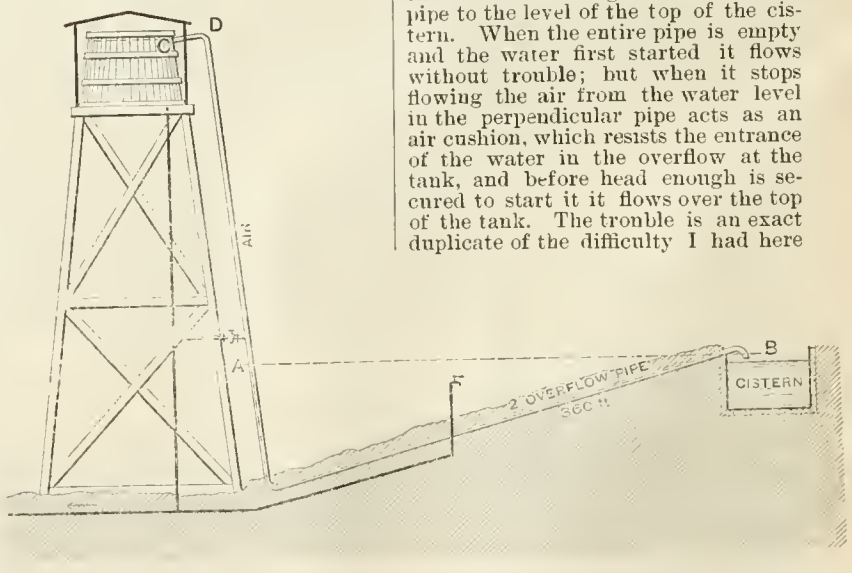


Fig. 2.—Showing Trap in Pipe.



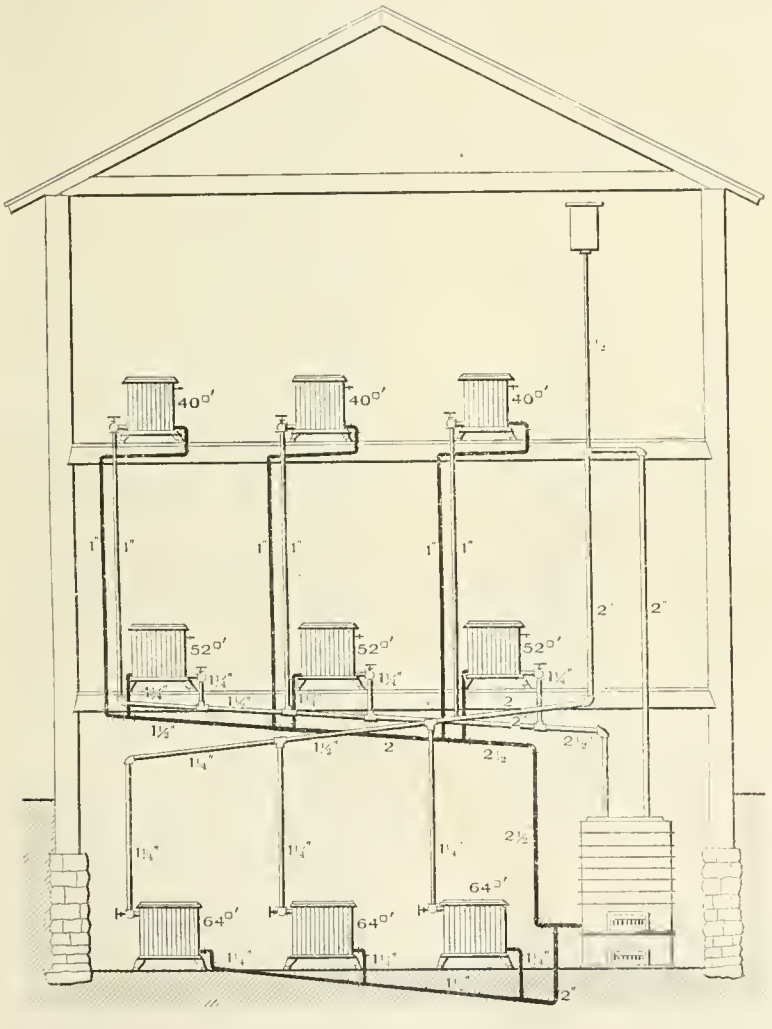
Pipes from Tank.—Fig. 1.—Showing Arrangement of Pipes.

From W. E. W., *San Diego, Cal.*—I think "M. T. C.," Riverside, Cal., whose letter appeared in *The Metal Worker* of December 23, is having trouble because the pipe is air bound, the water standing in the overflow pipe to the level of the top of the cistern. When the entire pipe is empty and the water first started it flows without trouble; but when it stops flowing the air from the water level in the perpendicular pipe acts as an air cushion, which resists the entrance of the water in the overflow at the tank, and before head enough is secured to start it it flows over the top of the tank. The trouble is an exact duplicate of the difficulty I had here with the same kind of an outfit, and which I remedied by disconnecting the overflow pipe from the tank and putting a tank about 30 inches deep on the top of the pipe to cistern and letting the overflow from the tank empty into it and thereby getting head enough to start it. The pipe entered the small tank at the bottom and the arrangement worked perfectly.

Piping a Hot Water Job.

From R. E. M., *Philadelphia, Pa.*—Being somewhat interested in the subject of hot water heating, I wish to ask your readers for their views on piping a piece of work having three radiators on the same level as the boiler, three on the first floor above and three on the second floor above. From the construction of the work it seems to me that it would be very difficult to get proper circulation.

Answer.—This appeal seems to be directed to our readers, and we hope they will embrace the opportunity to discuss the subject of getting circulation through radiators on a level with the boiler. We take the liberty, however, of submitting the following plan for piping such a house as described, presuming that the radiators are one above the other and all on the same side of the heater. As shown by the illustration, probably the simplest way for the first and second floor would be to take a 2½-inch flow pipe from the heater, rising 1 inch in 10 feet, toward the extreme end; taking a 1¼-inch branch from the top of the main to the first radiator on the first floor above the boiler. Then reduce the main to 2 inches and take a 1-inch riser to the first radiator on the floor above. Take another 1¼-inch connection from the top of the main to the second radiator on first floor; continue the main the same size and then take a 1-inch riser to the second radiator on the floor above; then reduce the main to 1½ inches and take a 1¼-inch connection to the third radiator on the first floor; then reduce the main to 1¼ inches, and continue to a point where it turns up, with a reducing ell to a 1-inch riser to the last radiator on the floor above. Place an air valve at the highest point on the return end of all the radiators on the first and second floors. The return mains should be carried alongside of the flow mains, receiving the return connections from the radiators, all being the same size, with a fall toward the heater of 1 inch in 10 feet. The radiators on a level with the heater should have a separate main, using a 2-inch syphon connected from the top of the heater and running up to the ceiling on the first floor, turning with an elbow and a nipple into a T. Take ½ inch air pipe from the top of the T to expansion tank located on the upper story above the highest radiator. Then from the bottom of the T carry the main 2-inch pipe down to the cellar ceiling, running across and falling toward the furthest radiator, with a fall of at least 1 inch in 10 feet. From the side of the main take a 1¼-inch connection to the top of the first radiator, then reduce main to 1¼-inch pipe and take another side connection to the top of the next radiator; then reduce the main to 1¼ inches, running over and dropping down to the top of the last radiator. The returns should connect at the bottom of the radiator on the opposite end. The return connections should be of a size to correspond with the flow connections, and the main should increase in size to correspond with flow main and fall 1 inch or more in 10 feet toward the heater, rising suddenly into the return of the heater. It will not be necessary to place air valves on cellar radiators, but a quick opening valve on the flow connections on all the radiators would be an advantage.



Piping a Hot Water Job.

Fails to Heat First Floor.

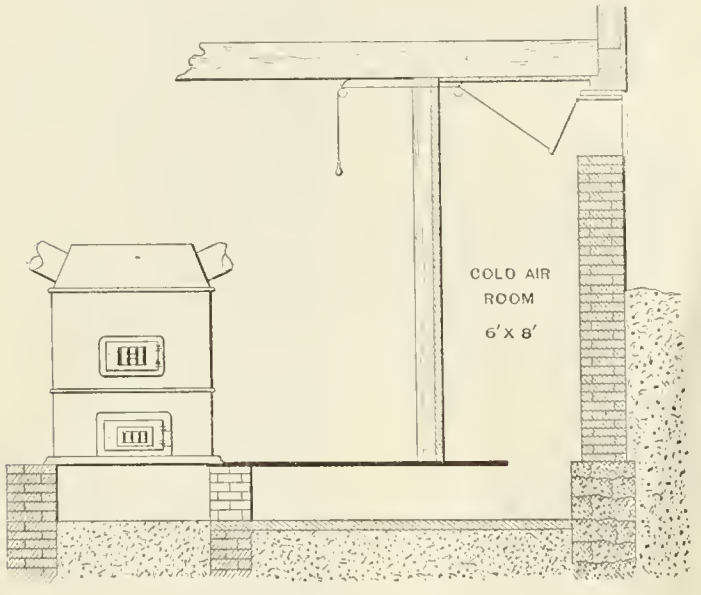
From A. G. D., *Marlton, N. J.*—I apply to The Letter Box for information on the following: One of my customers has a fireplace heater that does not work as well as it ought to. It fails to heat the parlor, which is a room 12 x 20 feet, with an 8 x 10 register opening about 5½ feet from the floor. The hot air flue is brick, 8 x 8, with a cut off in it just 4 inches above parlor register. When the cut off is opened the heat warms two rooms on second floor nicely. It also heats a room 12 x 20 that it is in, but fails to heat the parlor, and I would like some information as to the cause through The Letter Box.

Answer.—As we understand the statement of our correspondent, the fireplace heater is in one room, which is 12 x 20 feet, and the flue that leads from it has an opening in another room on the same floor. The difficulty of heating a room on the same floor has been experienced by all who have set fireplace heaters. Our correspondent's flue capacity is 64 square inches, while his register capacity is only 53, which shows that the register in the parlor is too small, when the cut off is closed, to force all the heat into that room. The register should always be somewhat larger than the capacity of the flue to allow for the friction of the air passing through it. The location of the room to be heated has another influence. If it is on the north or west side of the heater some difficulty will be experienced in getting the air to pass into it. The register being placed so near the ceiling has a tendency to create an up draft from the heater and bring the current into the room; but if there is no sufficient outlet for the air, it is hardly probable that the strength of the current from so short a flue would overcome the resistance of the air that is already in the room to the entrance of more. The parlor could be heated more readily if a register was placed in the floor and a pipe connected with the base of the fireplace heater, so that some air would be drawn from the room to supply the heater and make room for the hot air to enter. We should, however, particularly recommend our correspondent to consult the manufacturers of the heater, who are interested in the success of the apparatus and are in the best position to give advice.

Loss of Heat from Furnace.

From C. J. A., *Denver, Col.*—Replying to the inquiry of "C. E.," New York, in *The Metal Worker* of November 18, who says his customer's furnace heats the cellar, there are several reasons for a furnace heating the cellar, and one or more of the following causes may be the difficulty: 1, improper location of furnace; 2, hot air pipes being too long and too small; 3, poor air supply; 4, construction of furnace casing; 5, lack of ventilation. Any one or more of these would result in the furnace radiating its heat in the cellar. The erection of a heating plant to suit the various conditions and to conform to the different constructions met with has to have careful consideration by the heating man, and the success of the furnace, so far as the work installed is concerned, depends upon his skill and knowledge. The furnace should be located as near the center of the house as possible, and the proper arrangement of hot air flues and registers should be carefully considered before work goes in.

They should be located with a view to getting the air into the rooms the shortest and most direct way. Their sizes should also be considered. The most exposed and remote rooms should have the largest pipes, while upstairs apartments should have smaller pipes for same sized rooms, the difference being about one-third. This difference is because of their hight and the rapidity with which hot air ascends. I would advise all registers for first story being in the floor and those for second story in side wall. It is expected that connection of ample capacity has been made with the several rooms to insure good work, and the proper fittings have been made. It is assumed that the furnace is of sufficient size to heat the house to the desired temperature in coldest weather. Its casing is an important factor. "C. E." describes one quite efficient to avoid loss of heat in cellar, provided its construction is such that it fits the furnace, *i. e.*, permits sufficient air to pass through between it and the furnace, and that the bonnet has ample space—at least 6 to 10 inches—between its top and top of radiator for an air reservoir. There should be at least 2 feet between top of furnace bonnet and under side of joist, 2½ feet being better, to insure longest pipes proper elevation. The cold air supply is of vital importance. There should be a cold air room built, about 6 x 8 feet for an eight or nine room house, with duct leading from same to furnace, and outside opening to admit cold air equal to combined sizes of all hot air pipes leading from the furnace. The outside opening should be covered with coarse wire screen and provided with regulating damper, all as per sketch. This will insure a positive air supply. As the rooms to be heated are full of air when we commence to heat them, it is necessary that there should be some provision for ventilation. A well ventilated room can be much quicker and better heated than one that is not ventilated, showing conclusively that if there is no way for the air to escape, the hot air pipes will stop bringing in hot air and establish a circulation with other rooms connected with the furnace, and by so doing the furnace would overheat the cellar.



Loss of Heat from Furnace.

Computing Furnace Capacity.

From C. J. A., *Denver, Col.*—In reading The Letter Box of your valuable paper of September 16 and December 23 I noticed inquiries for some simple way of finding the number of cubic feet of space that can be heated by a furnace having a given size fire pot and grate surface. I am a believer in a free exchange of opinions based upon practical experience that will help the dealer and pave the way to overcome some of the unnecessary evils that are met in every day competition, by educating the inexperienced furnaceman to figure on a furnace of ample capacity to do the heating of the job upon which he is called to estimate. The dealer having made himself familiar with the building and all its requirements, must then determine the size furnace capable of heating it. It is expected that the dealer knows the heating capacity of each size of the furnace that he handles, as the successful heating of a building lies in having ample capacity in the furnace, just as successful ventilation depends upon the size of the pipes or flues. The small size furnace and small pipes for feeding fresh and drawing off the foul air are the source of many failures. The size of furnace need not always be in ratio to the size of building, as much depends on the exposure, material of walls and the glass surface. While I know of no rule used by manufacturers in basing the heating capacity of the several different sizes and constructions of their furnaces, the generally considered important question is, What is the amount of the heating surface? It is not the amount of surface in a construction, but its relative value as heating surface in proportion to the size of the firepot. The general opinion is that the furnace which heats the largest amount of surface with a given amount of fuel, all things equal, is the most economical. Good heating surfaces, exclusive of the firepot, are those so located in the furnace that the products of combustion will be compelled in passing over them to impinge against and heat them. They must be of such form and so arranged that the air in passing through the furnace without being retarded will be compelled to impinge against them, for practically only that portion of the air passing through is heated which comes in direct contact with the hot surfaces. It has been my experience in selling and placing furnaces that those give the best results which have their surfaces located as described, or nearly so, with their radiator construction such as will compel the products of combustion to make an indirect passage through a drum, and not allow a direct passage from the firepot to the chimney. This keeps the radiator part of the furnace as hot or hotter than its firepot. A furnace which is constructed so that the firepot when in operation is its hottest part does all or nearly all the heating from the firepot. Air coming into a furnace at the bottom and passing over the hottest surface first is heated to such a temperature that the surfaces above cannot impart heat when the air already has a higher temperature than they have. Air increases in volume according to the degree of temperature to which it is heated. It must be understood that air is not heated by radiation, but by contact.

While I do not claim the following formula is a satisfactory one for all the different kinds of furnaces, and may be varied from 10 to 25 per cent. in regard to area of hot air pipes and cubic contents to be heated in residence work according to conditions, I do claim it a good one to figure furnace capacity in general work.

The firepot should be round and of a depth equal to two-thirds its diameter at top, and its grate at least within 4 inches of the diameter of firepot. For instance, to find the heating capacity of a furnace having a casing 45 inches diameter, with firepot 24 inches and grate 20 inches, square one-half the diameter of the firepot and multiply the product by 3½, and the result will give the area of the number of 10-inch pipes or their equivalent that the furnace will supply. The area of firepot multiplied by 40 will give the space in cubic feet that the furnace will warm. The following table will make my method more clear:

Table of Furnace Capacities.

Diameter of casing.	Diameter of firepot.	Number of 10-inch pipes.	Area of fire pot.	Area—cubic feet.
In.	In.	Sq. in.	Sq. in.	
36	20	4 = 312	314	12,560
40	22	5 = 390	380	15,200
45	24	6 = 468	452	18,080
50	26	7 = 546	531	21,240
55	28	8 = 624	616	24,640

Annealing Sheet Iron.—II

Past and Present Methods of Annealing Sheet Iron and Preparing It for the Market.

BY AMBROSE BEARD, CAMBRIDGE, OHIO.

Another furnace of recent design is that illustrated in Fig. 5. This furnace works with good effect. Instead of being fired at the side, as is usually the case, it is fired at the back. Note fire chamber A. The flame passes over the bridge with a down draft to passage B. It then divides and passes along the sides of the furnace and enters the annealing chamber D, through ports C. When in operation the furnace is made air tight by means of brick lined door, E. The smoke stack F is placed between two furnaces and it serves each in common. Boxes are loaded on track H and are moved forward upon the wrought iron carrier G. The idea in using this carrier is to take a loaded box to any furnace that is empty

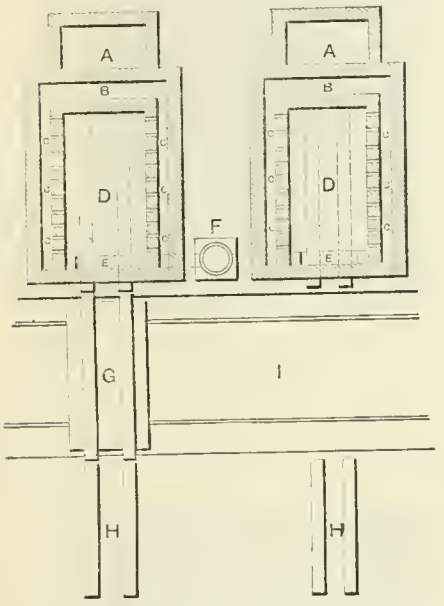
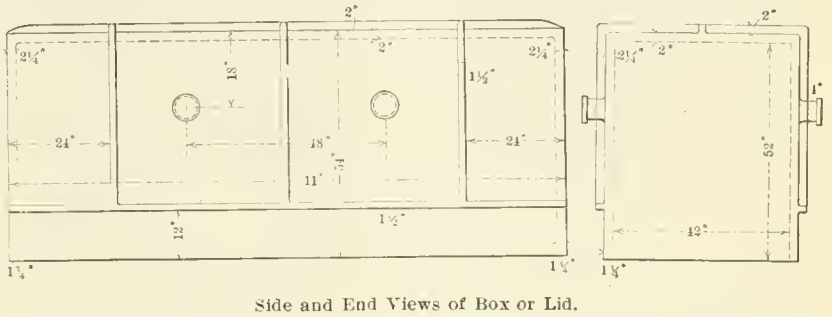


Fig. 5.—Ground Plan of Single Box Annealing Furnace Used for Sheet Iron and Black Plates for Tinning.

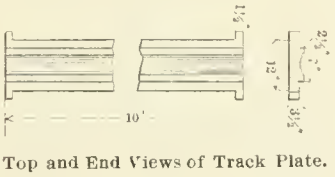
or *vice versa* to any vacant loading place. Any number of furnaces may be placed in line and operated in this manner. Carrier G is made very strong of I beams, with tracks fixed upon it of the same section as those inside the furnace and at the loading place. If it is required to move a box from one furnace to another, it is placed on the carrier G and drawn in either direction on rails laid in the sunken pit I. To insure perfect action it is desirable to allow the ends of the track plates on the carrier to overhang the sides of the pit about 6 inches, sufficient play being allowed to avoid obstruction. In following this plan all boxes or lids may be raised at one point, thus saving the expense of several hoisting devices. The boxes and their contents can be easily moved in any direction by using a strong chain attached to a fixed double purchase crab. Furnaces built in a similar manner to Fig. 5 are used extensively for annealing black plates for tinning.

Furnace Equipment.

After an annealing furnace is built there is considerable outlay required before it is ready for work. In Fig. 6 designs are shown of track plates upon which the weight is moved backward and forward, the carrier upon which sheets are piled, and the box, lid, or cover, as it is variously termed, which protects the sheets during the process and prevents oxidization. The only point upon which there is any wide divergence of opinion among mill managers is the respective use of cast and wrought iron boxes. There are many claims made in favor of each, but, as a matter of fact, both kinds are used in about equal proportions. The foundry man will argue in favor of cast iron boxes and the boiler maker will urge the use of wrought iron boxes. The equipment illustrated is used in the following manner: After the track plate is properly laid, cast iron balls

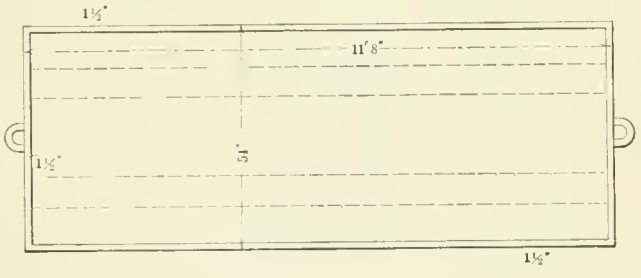


Side and End Views of Box or Lid.



Top and End Views of Track Plate.

End View of Carrier.



Top View of Carrier.

Fig. 6.—Annealing Box and Carrier.

are placed in the groove, about two feet apart, and upon them the carrier is set, the carrier having a groove on its under side corresponding with the groove in the track plate. Between these two grooves are the solid cast iron balls, made of a smaller size than the groove in the track plate so as to avoid binding. When the carrier is loaded with sheets, carefully piled so that the edges do not lap each other, the box is raised, then lowered over the pile of sheets until it rests firmly and squarely on the carrier. Air is then excluded by placing sand around the bottom of the box, and it is drawn into the furnace, where it remains for 18 hours or longer until properly annealed.

The means employed to raise and lower boxes vary. Generally a steel frame crane is used, as it can seldom get out of repair and is considered safe. Other hoists are used, which are generally constructed according to some local idea. To move the loaded boxes in and out of the furnace all that is necessary is a crab or winch. A loaded cast iron box, together with its carrier and contents, will sometimes weigh 25 tons. In double furnaces the total weight passed in and out would be 50 tons. This mass is usually moved by four men, two at the crab and two watching the balls to prevent them from locking if allowed to run loose, as they would sometimes do when the bed of the carrier is not level.

The equipment of annealing boxes illustrated in Flg. 7 is that used in annealing black plates for tinning. The method of operating is the same as described for sheet iron, except that it is on a smaller scale.

In both cases here referred to the life of an annealing box depends very much upon the treatment it receives. If it is subjected to extreme heat it will burn, and if, while hot, it is subjected to sudden cold it will more than likely crack. In some mills boxes burn out in three to four months, if made of cast iron, but the writer has known instances when boxes have lasted as long as nine months without a crack and six months longer after a patch of wrought iron was riveted on, making a life of fifteen months before becoming useless. If proper care is exercised when a box load of finished iron leaves the furnace and it is uncovered at a time when the rays of heat can be felt at a distance of three or four feet, the sheets will present a good color. If unloaded too soon they will turn red, and if allowed to get perfectly cold the center will be gray and the edges blue. Upon this the color very much depends. If proper care is taken a uniform color is easily obtained.

Experimental Annealing.

There has been a great deal of talk indulged in by sheet mill managers regarding the possibilities of radical

changes in annealing methods, but nothing of a very encouraging nature has yet developed in this line. It seems that, for the present at least, the art has reached a stationary condition. If no other reason can be advanced to support this theory, the reason that business is not in a condition at present to warrant experimental expenditure will hold good. Within the knowledge of the writer, the only steps taken toward making important changes in the acknowledged best method were attempts to anneal sheet iron without using a cast or wrought iron cover. If this could be accomplished and results obtained equal to those of the present practice, it would be a valuable innovation; but experiments have not demonstrated that this can be done. A furnace built with a lining of fire brick tile, around which the flame passed without entering the annealing chamber, has been tried, but the result of annealing was not of a successful character. There is really no serious cause for complaint as regards the modern method. It is cheap and effective, but slow. It is necessary to count on at least a week for filling a special order of box annealed sheet iron after the specification reaches the mill, even if the rolls are in condition to receive it, but it is safer to count on ten days. It is easy to figure on one day for rolling and three days for annealing, cooling and shipping, and this can be done, but with a book full of orders, each as urgent as the other, and exigencies to be met with, it is best to allow the full limit of time. Now, if some man can suggest or introduce a method of annealing sheets perfectly without using boxes and do the work as fast as sheets are rolled it will be worth looking into.

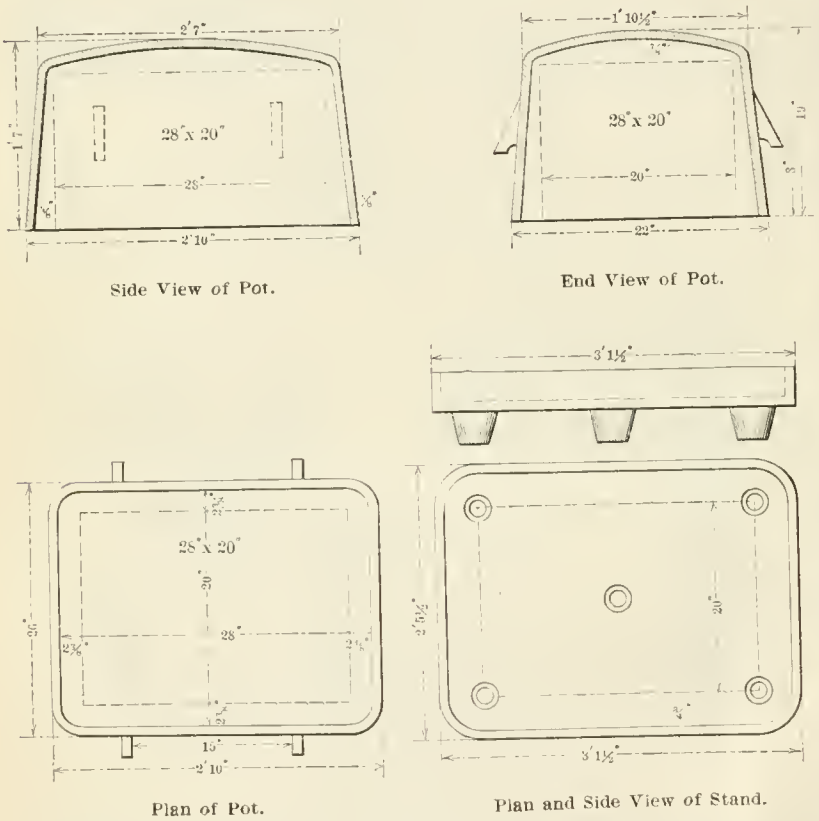


Fig. 7.—Cast Iron Annealing Pot and Stand for 28 x 20 Plates.

Pointers for Shippers.

The last man to handle sheet iron before it leaves the mill is not free from responsibility. The material may reach him in the best possible condition, but unless he takes proper care it will soon be in an unfit state for shipment. It is often the case that a shipper will allow workmen to sit upon piles of finished iron to eat their meals, spilling coffee, grease, &c., over the iron. This is a reprehensible practice. The greatest possible care should be taken to keep the sheets clean. A buyer may not say anything about it, but he will appreciate the fact that the mill sending out the neatest looking shipment must be best managed.

In marking bundles there is a great deal of difference noticed when the material reaches the warehouse of the jobber. It is a great mistake to cover the top sheet of a bundle with paint marks. Fig. 8 is a specimen of a daubed bundle.

The marking on this bundle is scattered all over it. The roller's chalk marks and name are still left upon it, and its general appearance is unsightly. A bundle marked in this manner would carry a bad reputation for the maker wherever it went. The tinner would tell the jobber not to send any more like it, and the jobber would place his orders elsewhere. It is not necessary to scatter the marks and brands. They should be concentrated at one end of the bundle, as shown in Fig. 9.

No other marks are necessary. The D in the left hand corner represents the roller's initial, so that if any complaints are made by the consumer regarding defects the trouble can be traced. It is as necessary to exercise care in shipping sheet iron as it is in shipping any other class of goods. A shipper should keep his warehouse tidy, and stack his bundles so that he can find a required size at a moment's notice. He should keep an account of all iron received and all iron shipped, and when January 1 comes he can check his inventory in ten minutes instead of having to employ half a dozen men for a week to move the material. The shipper who watches these points is casting bread on the waters. It has taken time and trouble to get the finished product to his department, and he cannot be too careful in applying the finishing touches.

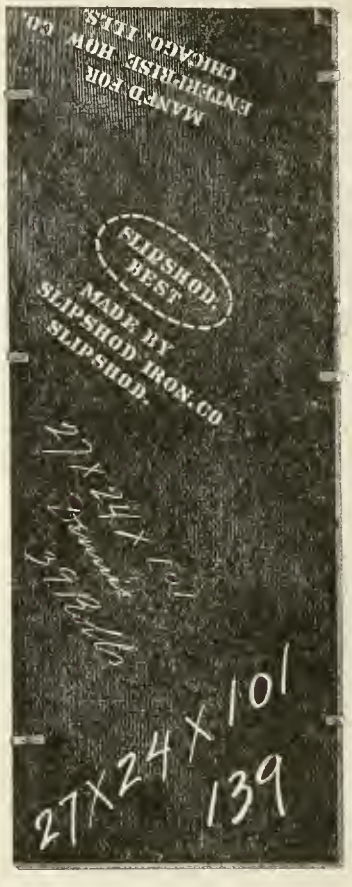


Fig. 8.—Improper Method of Marking Sheet Iron.

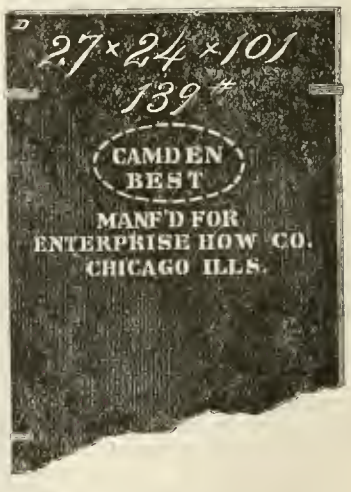


Fig. 9.—Correct Method of Marking Sheet Iron.

[THE END.]

Germany's naval experts have decided that the best color to paint their cruisers and torpedo boats, in order to make them as difficult of observation as possible, is a kind of dirty buff. They recommend that the whole of the vessels should be uniformly coated with this color, and that nothing on their decks or upper works should contrast with it.

PLUMBING and GAS FITTING.

Domestic Electrical Work.—VII.*

By W. A. W.

Burglar Alarms.

We have shown what an important part electricity may play in the saving of human life by giving timely warning in case of fire. There is yet another danger that it is well to guard against—the midnight prowler, who enters the dwelling while all its inmates are asleep and plunders everything within reach, not infrequently ending with assault or murder. This danger is even more to be feared than fire in some instances, for here we have all the cunning of which human nature is capable to guard against.

There is for this no more reliable protector than electricity. It is a ceaseless, never sleeping sentinel, always on duty and ever ready to give warning at the slightest attempt at intrusion.

In installing a system of burglar alarms, it should be born in mind that it is both safer and more agreeable to scare a burglar off than to fight him off, and the system that will most successfully accomplish this comes the nearest to being perfection; at least, that is the writer's view of it. Another point to look after carefully is to conceal all wires, batteries, &c. Knowing full well that the average burglar is possessed of a great deal of ingenuity and cunning, too much importance cannot be attached to this part of the work. The writer has found burglar alarm systems installed in quite pretentious dwellings where the battery was set on a shelf at the head of the cellar stairway, and the switch placed on the inside of the cellar door casing, with no connection on the cellar door or windows. A burglar entering this house through the cellar would at once divine the object of this battery and switch, and if he was possessed of the slightest reasoning power would, before proceeding further, disconnect these and keep silent the obnoxious bell. A system installed in this manner is simply ridiculus. It is worse than none at all, for while the occupants are sleeping in fancied security a burglar may be ransacking the house, and next morning burglar alarms in general will be condemned as useless "fakes." The writer cites this case in order that the beginner in this class of work may guard against committing a like folly.

The battery, annunciator and switch should be located in the chamber occupied by the head of the house. The battery and switch can be placed in a closet which opens into this room only, so that nothing but the annunciator need be seen, and in no other part of the house should the slightest suspicion of a burglar alarm be visible. In addition to the ordinary door and window connections, electric burglar alarm floor matting may be used. This is an article that beats the craftiest of burglars or sneak thieves. The latter is perhaps the hardest of all dishonest persons to guard against. He is watching your every movement, sneaking in as you go out and sneaking out as you come in, leaving no trace behind him except the loss of what he has pilfered. But this electric matting watches his footsteps and gives warning of his presence. This is placed under the carpet, and no sign of it is visible on the surface. It can be put in front of doors, under windows, in the center of the room, on the stairway; it can be so placed that it will be impossible to step from one room into another without causing an alarm. In order to make the scaring off plan more effectual, where gas is used an automatic electric gas burner may be included in the circuit in each room, so that at the first attempt to enter the house the gas is automatically turned on and lighted, and it is safe to say that any burglar will take to his heels with the ringing of a bell in the house and the light of a gas jet flashing in his face.

Fig. 14 shows a burglar alarm circuit with five connections. The heavy lines indicate the battery wire and the light lines the return wires. The dotted line indicates the wire running from battery to annunciator to operate the continuous ringing attachment (with which every burglar alarm annunciator should be provided). A is the annunciator and B the battery. Where more than one opening is connected from the same room all the return wires from that room should be spliced together and but one wire run to the annunciator and connected to the name or number corresponding to the room.

A switch must be connected to the battery wire so that it can be switched off to permit of the opening of doors and windows during the daytime. For window connections there is perhaps none better than what is known as the ventilating window spring. It possesses the advantage of permitting a room to be ventilated in warm weather without interfering with the alarm. By raising the window a little higher than it is intended to be left and then drawing it down to the desired hight, say, for instance, so that a man cannot crawl through without moving it, the alarm is in proper position. The window can at any time be closed entirely without in the least disturbing the alarm, but the slightest upward movement of the window closes the circuit and sets off the alarm.

The burglar alarm system just discribed is the one usually adopted for nearly all classes of buildings, but there are cheaper as well as more expensive systems. A cheap, and at the same time very serviceable system, may be installed in the following manner: Make a complete circuit about the

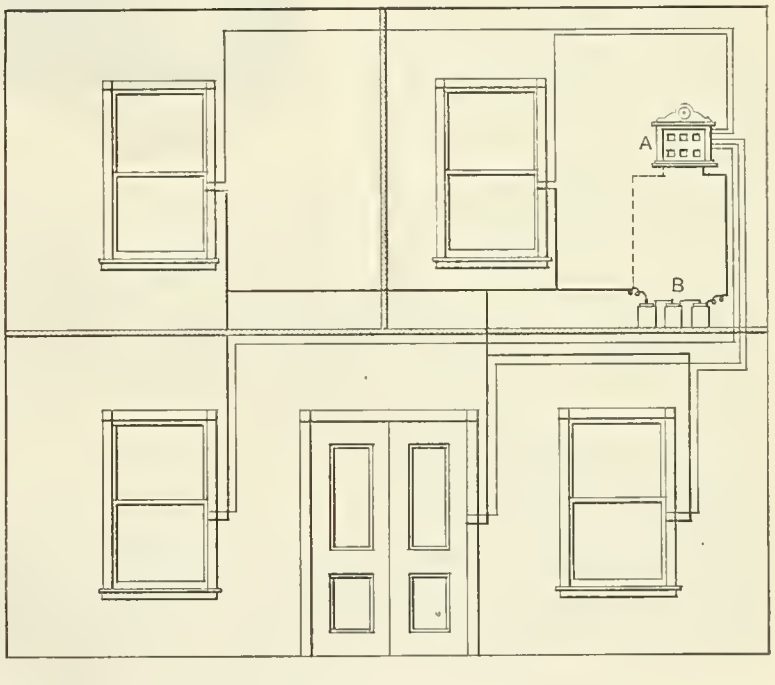


Fig. 14.—Burglar Alarm Circuit.

building with the wires. Use an ordinary electric bell (a large size, however). Start one wire from the battery, the other from the bell, terminating their ends in one of the connections. Now from each door or window connection run one wire and splice to the return, and one to the battery wire; then running a wire from the battery to the bell completes the job. This makes a very inexpensive alarm, and will indicate an attempt at housebreaking just as effectually as a more expensive system, the only inconvenience being that there is nothing to indicate in what part of the house the attempt is being made.

The most perfect, and in some cases almost indispensable, system is the combination annunciator and automatic clock work cut out. With this instrument the system may be so arranged that where servants or others arise earlier than the family the clock work automatically cuts out the desired sections at any hour it is set for, so that doors or windows may be opened in such parts of the house with out disturbing any one where the annunciator is located.

* Copyrighted, 1893, by David Williams.

Thus far the work described has been such that the intruder could not gain access to the system of wiring without first causing an alarm. We have, however, another class of work wherein the electrician must exercise even more caution in installing the apparatus—that is, safe and desk alarms. It may be desirable to protect a safe or desk so that its improper opening will cause an alarm, and here the only reliable system to use is the closed circuit system. The safe breaker is very clever and he may have opportunity of discovering the wires of an electric alarm, which by properly cutting he may render useless and proceed with his work undisturbed if the open circuit is used. With the closed circuit this last recourse is denied him. If he disturbs the circuit in any manner by cutting a wire or disconnecting the battery the alarm is sure to sound; if he opens the door of the safe or the desk the same thing will happen; he is confronted with a case of "hands off." All connections used in this work must, of necessity, operate just opposite to open circuit connections—that is, on being disturbed, they must open the circuit instead of closing it.

An ordinary electric bell is used, the battery consisting of one open and one closed circuit. The open circuit battery is connected with the bell in the usual manner of putting up an electric door bell, except that the circuit is continuous without any break. The closed circuit battery is connected with the alarm connections and the coils of the bell, and when in position for work is also a continuous circuit without break. Note, however, that this circuit is connected only to the coils of the bell, so that the current from the closed circuit battery will circulate continuously through the coils. This will cause the armature (which carries the hammer) to be held tightly against the magnet, thereby keeping open the open circuit battery by holding the armature away from the contact screw. The moment, however, any of the burglar alarm connections are tampered with and the closed circuit opened the armature is thrown back by its spring, and coming in contact with the screw closes the open circuit battery, causing the bell to ring until the current is switched off or the battery runs down. One important advantage this system possesses is that if anything gets out of order it rings an alarm at once.

To Organize Maine Plumbers.

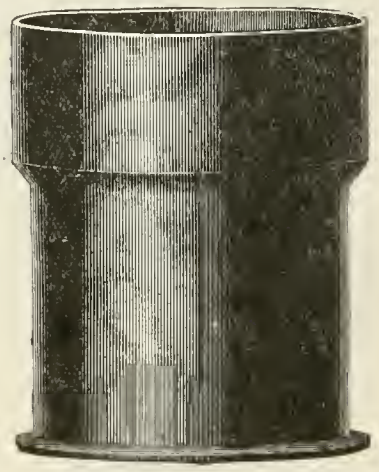
Daniel G. Finnerty, president of the National Association of Master Plumbers, is sending out the following notice to the master plumbers of the State of Maine:

To the master plumbers of Maine who feel the need of organization to insure a higher class of workmanship, more harmonious relations between each other, and such protection as only the National Association of Master Plumbers can extend, I wish to say: In company with the State vice-president of Maine, Jno. B. Smith of Lewiston, I will visit Bangor, Monday, January 22, and hold a meeting at the Bangor House at 3 p.m.; Augusta, Tuesday, January 23, meeting at the Coney House, 3 p.m.; Lewiston, Wednesday, January 24, meeting at Hotel Atwood, 9 a.m.; Portland, Thursday, January 25, meeting at the Preble House, 2 p.m.

Master plumbers in cities and towns adjacent to either of the above cities are most cordially invited to be present and take an active part in the proceedings, intended for their mutual benefit. An association of master plumbers will be formed in each of the above cities, and every master plumber is invited to affiliate.

Cold Drawn Brass Ferrule.

The illustration presented herewith shows a plumbers' brass ferrule, made by Randolph & Clowes, Waterbury, Conn. Being made by a new process, these ferrules, it is said, are perfectly smooth and true in size and shape,



Cold Drawn Brass Ferrule.

which saves the plumber a great deal of time and labor. They are made from seamless drawn brass tubing, which prevents the possibility of blow holes or sand holes. Manufactured in this way, it is said that they have greater strength and are of light weight. Their smoothness enables them to be tinned readily, or they are furnished already tinned when desired.

Master Plumbers at the Trade School.

At 3.30 p.m. last Tuesday Superintendent John Delehanty assembled the day class in plumbing in the lecture room of the New York Trade School to meet the committee from the Master Plumbers' Association of New York. R. Fulton Cutting explained, on behalf of the school trustees, that this committee was interested in seeing that the class received such instruction as would make them qualified plumbers, and had given much time and thought to the assistance of the trustees. The members of the committee are Edward Murphy, Col. Geo. D. Scott, Frank Reynolds, Thos. J. Tuomey and James Muir, who were all present and made addresses. Mr. Murphy outlined the examination that would be made at the close of the term, so that the class might know what to expect and prepare for it, and their ability to pass a good examination would be evidence of a store of knowledge that would be daily needed by them as working plumbers. James Muir contrasted the opportunities of a young man learning a trade now and in the past, counseling the class to make much of the chance to draw upon the experience stored at the school. In their work after leaving they would never again be able to readily find valuable information, but would be left to their own resources and expedients. Colonel Scott advised them to study the construction of buildings, so as to be able to meet the requirements, rather than to adopt one system of plumbing for all work and to depend on some one else to lay out their work. Frank Reynolds explained the high grade of work that had been done by the classes in the past, and encouraged the new class to follow the instructions given and they would be able to keep their work up to the standard. Mr. Tuomey made no address other than to greet the class. Among others present were Mr. Brady of Byrnes & Brady, Harry Brill and J. Stanley Thomas.

Kelly's Frost Proof After Flush Water Closet.

Thomas Kelly & Brothers, 124 Franklin street, Chicago, are putting on the market Kelly's Frost Proof After Flush Water Closet, which is herewith illustrated. The trap and valve are placed below the floor, which is presumably so constructed that all danger from frost is avoided. When the closet is occupied the inlet side of the valve is opened and the discharge side closed, thus allowing the water to pass up into the tank as far as the water pressure will condense the air. With a pressure of 40 pounds the tank will be filled two-thirds full of water. Upon the seat being released the weight causes it to raise, and the connecting chain lowers the valve weight, thus opening the outlet valve and closing the inlet. The pressure of compressed air in the tank drives the

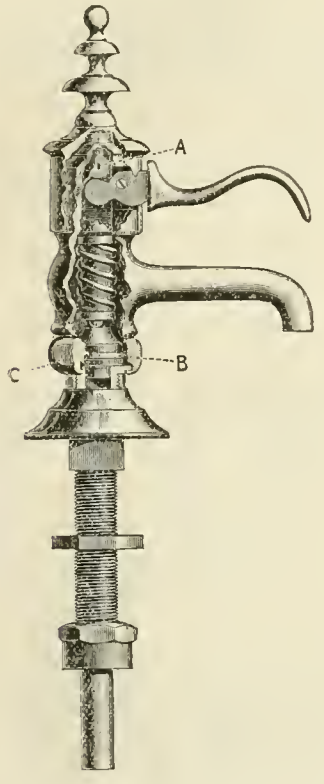
Kelly's Frost Proof After Flush Water Closet.

water into the closet with sufficient force, it is pointed out, to thoroughly flush it and wash its contents into the sewer. The lower the tank is placed the greater will be the force of the after flush. It will be seen that the

tank contains water only when the closet is in use, so that there is no chance for it to freeze.

The Porteous Self Closing Basin Cock.

The accompanying illustration shows a broken view of the Porteous self closing basin cock, manufactured by the American Brass Works, Cincinnati, Ohio, and recently put on the market. Referring to the illustration. A is a



The Porteous Self Closing Basin Cock.

wheel in the slot where the lever works and which causes very little friction, thereby being easily operated. B is a loose seat or disk, which may be lifted out by unscrewing the nut C. In this way a new seat may be inserted and the cock can be repaired at small expense. All the joints are said to be metal to metal, with no rubber used in putting the cock together, the only non-metallic material employed being the washer on the end of the stem.

TRAPS AND VENTS.

THE MASTER PLUMBERS' ASSOCIATION OF HOLYOKE, MASS., has chosen T. J. Carmody president and Charles P. Lyman secretary and treasurer. There are 12 plumbing firms in the local association.

THE MASTER PLUMBERS' ASSOCIATION OF NEW BRITAIN, CONN., has made arrangements to attend the State convention to be held in Hartford on February 15.

M. W. RYAN & CO. are a new firm in the plumbing business at 1114 Adams street, Toledo, Ohio. Mr. Ryan has an experience of 30 years and has done the work on many fine buildings in that locality.

A CORRESPONDENT STATES that the outlook for plumbing in Philadelphia is brightened by the extension of the trolley system of street car service. They are required to pave and repave all streets before putting down their tracks, and owners of property not heretofore connected with the sewers are compelled to make connection before the new pavements are put down.

ZACK & MYLIUS have bought a lot on North Broadway, Aurora, Ill., and will begin building operations at once. They will occupy the new structure with their plumbing business.

A MEETING of the Master Plumbers' Association of Cleveland, Ohio, was held in the rooms of the Builders' Exchange in the Arcade recently, and considerable routine business was transacted. The following officers for the ensuing year were elected: President, G. S. Papworth; vice-president, D. H. Roberts; treasurer, S. W. Burrows; secretary, L. Bonesteen; sergeant-at-arms, W. H. Cleveland; delegates to the State convention at Toledo, February 14, J. Schneeberger, W. H. Henderson, D. H. Roberts, W. J. Warden, Charles Streever. The advisability of the enactment of a State law regulating plumbing was strongly urged.

THE Brockton, Mass., board for examining applicants for plumbers' licenses, consisting of Dr. Frost, Clarence L. Mitchell and T. J. Kinney, had 14 applicants before them last week.

THE TORONTO STEEL CLAD BATH & METAL COMPANY, LIMITED, Toronto, Canada, distribute a very pretty illustrated catalogue relating to their Steel Clad baths. The cover, with lettering and embossed design, is printed in gold and red, giving a handsome effect. There are illustrations of the Steel Clad bath, with descriptive particulars and table of sizes and prices. Also a varied line of bath and basin cocks and other specialties.

ONE who is taken as an authority on trade education in England, H. H. Cunynghame, in championing the cause of technical lectures for workmen in that country, remarked recently that it was an absurd idea to imagine that mere "book education" would make a good workman. Steadiness and application he considered of infinitely greater value to the workman than any amount of literary instruction. As reported in the London *Plumber and Decorator*, he remarked further as follows: "Surely it is better for a plumber to solder straight than to spell correctly. I honor the plumber who spells badly, if only he solders well! Of course, it is best to do both well, but if a man is to gain a livelihood as a mechanic, it is necessary that his attention shall be concentrated on mechanics."

AT THE RECENT MEETING of the Board of Freeholders of Mercer County Prosecutor Bayard Stockton made application for an appropriation to ventilate the court room. Before the meeting Prosecutor Stockton appeared before the Court House Committee and explained in detail a plan to ventilate the room at a small cost. The intention is to conduct fresh air into the room by a number of pipes and circulate the air by electric fans. The Prosecutor estimates that the much needed improvement can be completed for less than $300.

THE MASTER PLUMBERS' ASSOCIATION OF NEW BRITAIN, CONN., recently elected the following officers: President, P. J. Toomay; vice-president, S. W. Damon; secretary, Fred Horsfall; treasurer, J. B. Weiant; trustees, Messrs. Damon and Brady.

THE MASTER PLUMBERS' ASSOCIATION OF TOLEDO, OHIO, elected officers for the ensuing year as follows: President, John A. Waite; vice-president, James W. Gould; secretary, Wm. G. Wacker; treasurer, Frank J. Kern; Executive Committee, James W. Gould, James Locke and Thomas Manlon. The Toledo association will entertain the State organization at its annual meeting, to be held February 13,

C. C. ERHARD has leased the north room of the Willaman-Schworm Block, on South Erie street, Massillon, Ohio, and on February 1 will open a plumbing and steam fitting establishment. Mr. Erhard is a son of Karl F. Erhard.

ADAMS & RIDER, Helena, Mont., have purchased the entire stock of the Helena Steam Heating & Supply Company, and have added it to their already large line.

NEARLY all of the business transacted at the recent convention of the master plumbers of the State of Massachusetts at Boston was in executive session. Eighty-three delegates were present, and a committee consisting of the presidents of the local associations was appointed to carry out the plans of the convention. The next convention will be held at Holyoke, Mass., on the second Tuesday in May. Though the association is but nine months old, the State is well represented and steps are to be made to increase the membership.

THE RECENT BALL of the Boston Master Plumbers stands first in honor of those given by the association. Fifty couples from out of town enjoyed the supper and took part in the dance.

STATE VICE-PRESIDENT DEEDY of the Massachusetts Master Plumbers of Worcester was at Waltham on the 18th to organize an association of master plumbers.

VICE-PRESIDENT JOHN MITCHELL of the National Association of Master Plumbers has been elected president of the New York Master Plumbers' Association and has a good corps of officers to extend the good work of this association.

JAMES F. TRAYNOR, one of the enterprising plumbers of Wilmington, Del., recently paid a visit to the trade in New York.

THE SHUSTER FOUNDRY COMPANY, Philadelphia, Pa., announce by a blotter sent to the trade, the "Plumbers' Vest Pocket Health Office Register," issued by them in 1890, has been so popular that it will be reissued this year with a full and complete price list. An invitation is extended to visit their plant to see the new and labor saving soil pipe fittings that can be best appreciated on examination.

THE LEXINGTON PLUMBING COMPANY of Lexington, Ky., recently elected the following officers: M. P. Lancaster, president; J. T. Slade, vice-president; W. Scanlon, secretary; E. D. Sayre, treasurer; J. H. Davidson, general manager; S. T. Campbell, superintendent. Directors: J. T. Shelby, T. D. Mitchell, R. D. Williams, J. W. Sayre, J. H. Davidson, M. P. Lancaster, J. T. Slade.

CHARLES SCHLOESSER, 1782 Lexington avenue, New York, is the recording and corresponding secretary, and Alexander Bryant of Macdonald & Co., 296 Third avenue, is the financial secretary of the Master Plumbers' Association of New York for the new year.

THROUGH the kindness of the newly elected financial secretary, John Kelly, we receive a list of the officials of the Brooklyn Master Plumbers' Association for the ensuing year: President, Martin Fallon, 53 DeKalb avenue; vice-president, Charles W. Evans, 5 Reid avenue; recording secretary, Wm. J. Gault, 509 DeKalb avenue; financial secretary, John Kelly, 99 Smith street; treasurer, Geo. B. Lewis, 660 Fulton avenue; marshal, John J. Keenan, 39 Raymond street; sergeant-at-arms, Oscar O. Sawkins, 357 Court street. Trustees: Edwin Hayward, George Cummings and Joseph Zoll.

PECK BROS. & Co., manufacturers of fine brass goods, sanitary specialties and plumbers' supplies, 259 Wabash avenue, Chicago, have just completed a thorough renovation of their showroom. It will well repay any interested plumber or architect who wishes to see the latest achievements in sanitary plumbing to call and examine this display. It can be frankly said that the window arrangement as a whole is one of the finest and most attractive, showing judgment, taste and an unlimited stock to select from. The floor of the window is covered with cream colored tile, having a deep rich border of arabesque pattern, forming a suitable setting for the onyx and choice marble lavatory and drinking fountain display. Among the articles shown are the new Boyd lavatory; the Triple Jet syphon closet; enameled iron bath (Roman shape), handsomely decorated in colors, and the solid porcelain English bath. On all the above goods are shown the firm's nickeled brass fixtures in special design. The whole display is finely set off by an elaborate network of brass at least 10 feet high, showing in plain relief in the fret work the words "Peck Bros. & Co."

THE A. Y. MCDONALD COMPANY, 168 Lake street, Chicago, have secured the agency of the Perfection Cleanout Company, Haverhill, Mass., and will carry a full line of cleanouts in quarter bends and straights, for 2 to 6-inch pipe, in both standard and extra heavy qualities. These cleanouts have a screw clamp to hold the cover in its place and make it fit tight. The hole is large enough to make the full width of the pipe accessible.

AN ADJOURNED MEETING of the Board of Health of Paterson, N. J., was held last Monday evening, for the purpose of hearing the views of the master plumbers on the bill to be submitted to the Legislature to be enacted as a law for the government of plumbing throughout the State. As a result the Master Plumbers' Association have been asked to appoint a committee to confer with the Board of Health and journeymen plumbers who drew up the bill, and a meeting will be held at the office of Dr. Leal of the Health Board next Monday night. Plumbers from different parts of the State have been present at the meetings.

D. W. YARBROUGH has bought the interest of his partner, T. R. Stephenson, and will continue the plumbing business in his own name at the old stand, 18 East Hunter street, Atlanta, Ga. Mr. Yarbrough is a well known Atlanta young man. He is a practical plumber, having had nine years' experience, and is a graduate of the New York Trade School.

THE CITY OF ALBANY, GA., has passed an ordinance for regulating plumbing and house drainage that is up to the ideas of the time.

ASHTON & GERAGHTY, Waterbury Coun., have been awarded the contract for plumbing the parochial residence of the Sacred Heart Church.

GEO. FOX, JR., has opened a plumbing establishment in the basement of the Sons of America Hall, south of railroad, at Wayne, Pa., and still retains his office on North Wayne avenue.

D. S. PAUL, a plumber, of Atlanta, Ga., so it is reported, is designing plans for the erection of a tower 1150 feet in hight for the Atlanta Exposition.

MORE THAN 100 DELEGATES are expected to attend the State Convention of Master Plumbers, at Toledo, Ohio, on February 13, and the local association are busy preparing for their reception and entertainment. If the weather permits the delegates will be taken for a drive. One of the famous theatrical entertainments of the Owl Yacht Club will be another diversion. The State officers are: L. Poplowsky, Cleveland, president; Robert Raitz, Toledo, vice-president; C. C. Dewstoe, corresponding secretary, Cleveland; L. E. Huddleson, financial secretary, Columbus; William Halley, treasurer, Columbus. These, with John A. Waite, Toledo; D. N. Kelley, Columbus, and H. M. Stowe, Marion, comprise the Executive Committee.

British Tin Plate Exports for 1893.

The returns of the British Board of Trade for December, 1893, include the following statistics of the exports of tin and terne plates from Great Britain for that month and for the entire year as compared with those for the two previous years:

Shipments to.	Exports in month of December, in tons.			Exports for entire year, in tons.		
	1891.	1892.	1893.	1891.	1892.	1893.
United States	13,536	23,417	14,031	325,143	278,477	255,583
Russia	5,317	4,434	2,723	30,802	27,914	30,526
Germany	405	394	268	2,704	3,951	3,137
Holland	329	377	522	4,830	4,386	5,323
France	868	655	823	6,242	9,433	11,321
Portugal (Azores and Madeira)	418	408	256	4,618	5,183	5,861
Italy	764	448	326	8,332	6,873	4,004
Roumania	..	....	....	3,988	4,560	4,286
Brazil	508	434	141	4,810	6,073	4,340
Argentina	93	418	245	3,572	3,085	3,302
East Indies	761	453	790	4,148	4,507	6,198
Australasia	1,348	734	1,012	10,497	7,927	7,704
British North America	1,727	969	1,195	19,935	14,826	16,000
Other countries	2,336	1,287	1,492	18,958	18,238	21,648
Totals, in tons	28,410	34,428	23,824	448,379	395,449	379,233

It will be seen from the above table that the total shipments of tin and terne plates to the United States last year were 22,894 tons less than those in 1892, while they in turn fell short of 1891 shipments by 46,666 tons. Taking into consideration the trade depression of last year, which unquestionably caused a material curtailment of imports, and setting it against the increase in consumption of tin plates which develops annually in the United States, it is fair to infer that they would about balance each other. The deficit in imports for the year 1893 would, therefore, be filled by the plates of domestic manufacture, which have been produced to about that amount during the year.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

BIDS WILL BE RECEIVED by Philip T. O'Brien, chairman of Building Committee, up to January 24, for a warming, ventilating and sanitary closet system to be used in a four-room school house to be erected at Clinton, Mass.

LYNCH & WOODWARD, Boston, Mass., are installing the heating plants in the Industrial Trust Company's new building, at Providence, R. I., and the handsome residence of Mrs. Leopold Morse, at Danvers, Mass., using Exeter radiators.

JOSEPH L. WHELAN, the plumber, of North Broad street, Elizabeth, N. J., has the contract for the plumbing and gas fitting in the new building being erected for John F. Rogge.

DUFFEY BROS., 117 Sutter street, San Francisco, Cal., are one of the representative plumbing houses of the Pacific Coast, and make a specialty of fine work and goods. One of the contracts completed by them last year was the erection of all of the plumbing fixtures and sanitary work for the Midwinter Fair Buildings. Another large contract which they filled was at the University buildings at Palo Alto.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until February 13, for a low pressure return circulation steam heating and ventilating apparatus for the United States Post Office building at Fremont, Neb. Drawings and specifications may be obtained from the Supervising Architect, Washington, or at the office of the superintendent, at Fremont.

THE KELLY & JONES COMPANY, 48 to 52 North Clinton street, Chicago, have contracts for steam heating in the Calumet Club Building, Michigan avenue and Twentieth street, and the Aldine Apartment Building, Aldine street and Evanston avenue.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until February 8, for low pressure steam heating and mechanical ventilating apparatus, elevator power boiler, &c., for the United States Court House and Post Office, &c., building, at Troy, N. Y. Drawings and specifications may be obtained from the Supervising Architect, at Washington, or from the superintendent, at Troy.

THE ILLINOIS HEATING COMPANY, 88 Lake street, Chicago, are to furnish hot water heating plants for the residences of W. J. Bridgeman, Woodlawn avenue and Forty-sixth street; James Hay, Homan avenue and Adams street; T. A. Norton, Austin, Ill.

THE BAKER & SMITH COMPANY, 193 to 197 Van Buren street, Chicago, are to furnish two horizontal tubular boilers and steam heating plant for the Pulaifer Building, Calumet avenue and Twenty sixth street. The boilers are also to supply power for pumping, elevator and electric light service.

THE DEPARTMENT OF PUBLIC PROPERTY of Easton, Pa., at a meeting held January 12, decided to advertise for proposals for steam and hot water plants for heating the three engine houses.

The framers of the Wilson bill, says the Troy *Times*, having classified hydraulic hose, which is used exclusively for extinguishing fires, among articles of wearing apparel, no doubt will remodel that extraordinary measure so as to include hydraulic rams and spinning mules in the live stock schedule.

ROOFING AND CORNICE.

The Sanders Skylight Chart.

BY H. M. SANDERS.

The following is a description with illustrations of a chart I have used for scale, and for the purpose of illustrating its working I have used a pitch of skylight that is about 7 inches to the foot; but any other pitch of skylight is equally applicable. For practical use in the shop the chart should be drawn full size in order to secure accuracy in laid out, as regards spacing off and locating the position of the bars. As the chart indicates, all measurements are taken from the curb line of the skylight.

It will be observed that the chart is triangular in form and its base, A B

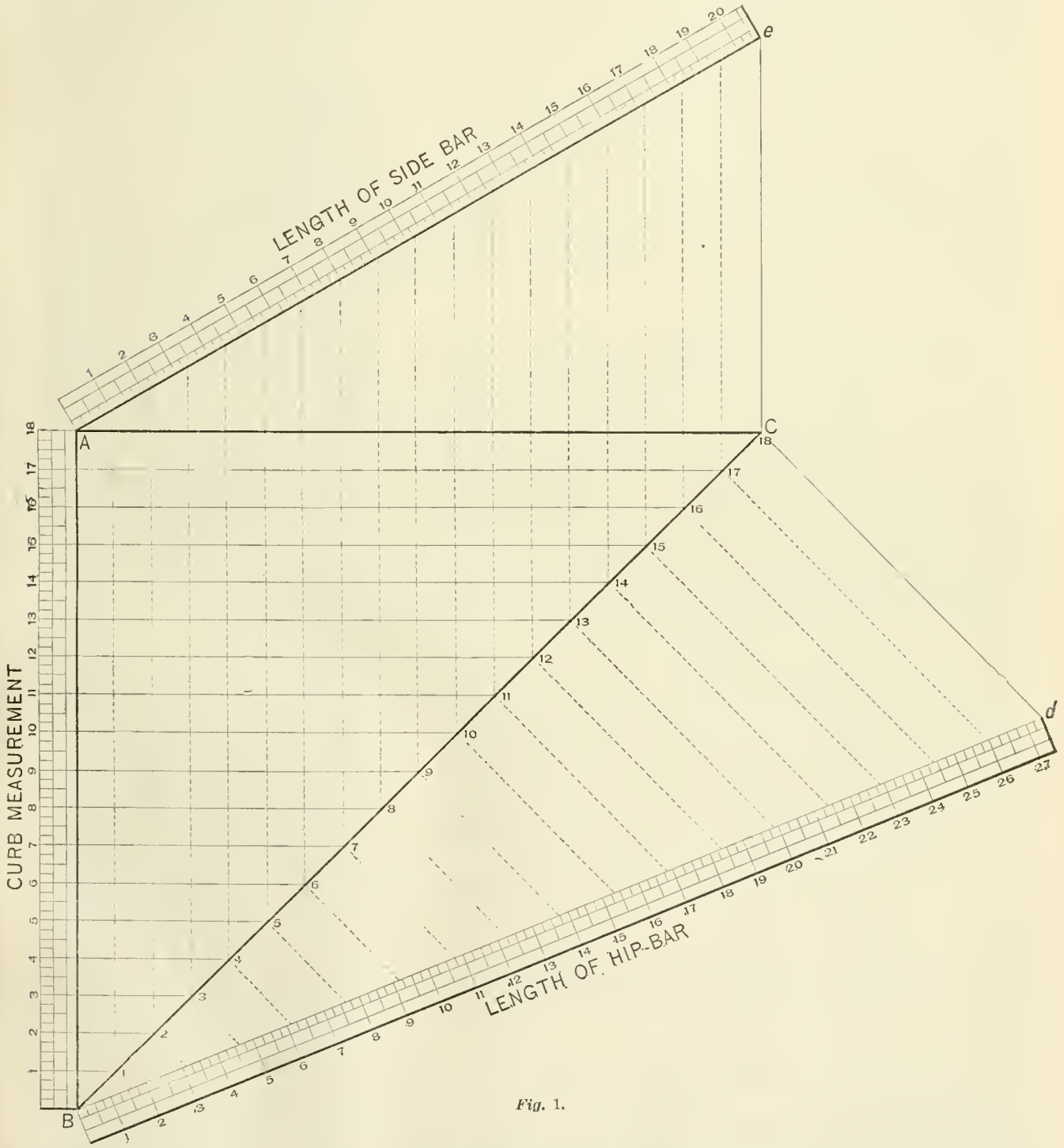


Fig. 1.

THE SANDERS SKYLIGHT CHART.

obtaining directly the length of bars for a hip skylight.

It will be observed that for convenience in publishing this chart in *The Metal Worker* it is drawn on a ¼-inch

determining the length of the various bars required.

The use of the chart as shown in Fig. 1 presupposes that the ground plan of the skylight has been properly

C, a right angle triangle, and the same as one-half of the ground plan of the end of a skylight. A B, as the base of this right angle triangle, represents the curb or measuring line of the skylight.

The line A C represents the ground plan of the side bar C *e*, drawn at right angles with A C and of sufficient length to give A *e* the proper pitch of the skylight. On this line A *e* we have laid off a rule or measuring bar representing inches and quarter inches, by which to determine almost at a glance the length of bar required at any given point. In the same or like manner, B C represents the ground plan of the hip bar. At point C we draw the line C *d* at right angles with B C and of the same length as C *e*, and this gives us B *d* on which to lay off our measurements for the hip bar. Draw lines from the measurements laid off on the curb line A B and interaect them with hip line B C at points 1, 2, 3, 4, &c., and from these various points for the hip bar continue these lines at right angles with B C and intersect them with the line B *d* as points of measurement. For the side bar draw lines from these same points 1, 2, 3, 4, &c., on this same line B C and at right angles with A C, intersecting them with the line A *c*. Thus we have eatablished A B as the measuring line of the curb of skylight, A *e* as the measuring line of the side bar, and B *d* as the measuring line for the hip bar.

A little practice will enable one to read readily the length of any bar required. While the measurement of the curb is on the line A B, the points 1, 2, 3, 4, &c., on the line B C represent so many inches respectively of the curb measurement. To illustrate: In Fig. 2 we have represented a skylight 2 x 3 feet. The curb measurement of this skylight, being one-half of the end of the same, is 12 inches. Referring to the chart, 12 inches is the curb measurement, or as shown by the number 12 on the line B C. Follow the dotted line from point 12 on B C to its intersection with line A *e* and it gives us 13¾ inches as the length of side bar, as shown by A C in Fig. 2. To find the length of the hip bar, as shown by B C in Fig. 2, we follow the dotted lines drawn from the same point 12 on line B C of the chart to its intersection with B *d*, and we have 18⅜ inches as the length of the hip bar B C, as shown in Fig. 2.

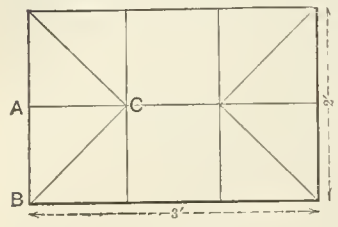


Fig. 2.

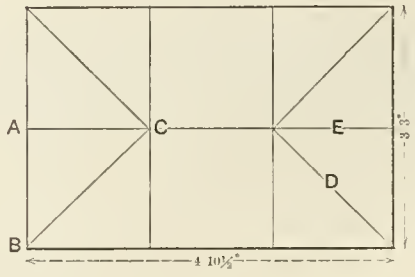


Fig. 4.

Let us suppose now we wish to find the length of bars for a skylight that is larger than is represented on the chart. For example, we have shown in Fig. 3 a skylight 10 feet square. In this skylight we want to find first the length of the hip bar K. The distance A B of this skylight represents one-half of the width of the skylight, or 5 feet, as the curb measurement to be applied to the chart. But we find that the chart does not cover 5 feet in length of curb measurement, so we take some number that is represented and that will go into 5 feet, or 60 inches, a given number of times. The highest number on the chart that will do this is 15 inches. Fifteen inches will go into 60 inches just four times. We find by referring to the chart that 15 inches curb measurement gives us 22⅝ inches as the length of the hip bars, as shown on line B *d*. Twenty-two and seven-eighths inches multiplied by four gives us 91½ inches, the length of hip bar K in Fig. 3. To get the length of side center bar D of Fig. 3, we find that the curb measurement of 15 inches gives us on the side bar measurement on line A *e* 17¼ inches. Seventeen and one-quarter inches multiplied by four gives us 69 inches for the length of this center side bar D.

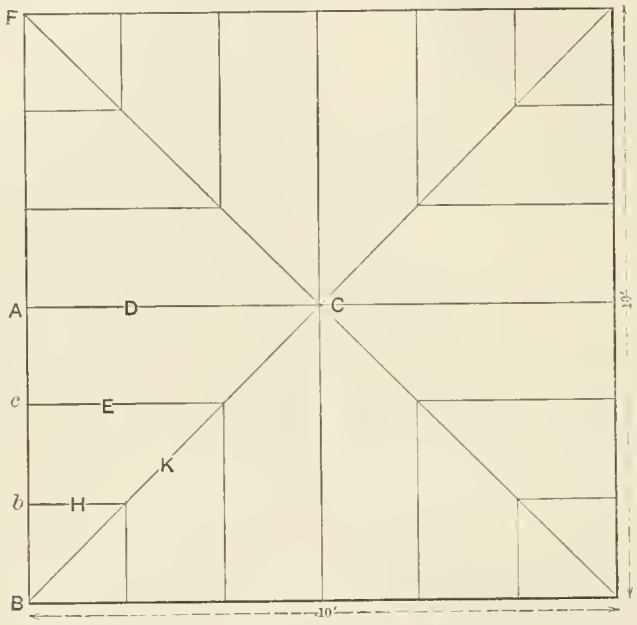


Fig. 3.

To get the length of the bars H and E, as shown in Fig. 3, we find first that the curb measurement for the H bar is represented by B *b*. B *b* is one-sixth of the distance from B to F, and as B F represents 10 feet, or 120 inches, B *b* is one-sixth of 120 inches, or 20 inches. Twenty inches, then, is the curb measurement from which to determine the length of the bar H. Twenty inches not being represented on the chart, we take the measurement of two numbers that are its equivalent, two tens. Ten inches curb measurement gives us on the side bar A *e* 11½ inches, which multiplied by 2 gives us 23 inches as the length of bar H. To get the length of the bar E, the curb measurement B *c*, as shown in Fig. 3, being twice as long as B *b*, the length of the bar E would be twice as long as the bar H, or 46 inches.

This same principle applies alike in the development of these bars in all cases and in hip skylights of any size or dimension, bearing in mind, however, that the curb measurement of the bar is always the distance from the center of the bar on the curb line to the corner of the skylight, as shown respectively by *c* B and *b* B in Fig. 3.

Suppose now we take an odd size skylight, as shown by Fig. 4. This skylight is 3 feet 3 inches wide, or 39 inches. This would make the curb measurement 19½ inches. As 19½ inches is not represented on the chart and is not divisible by any number of inches

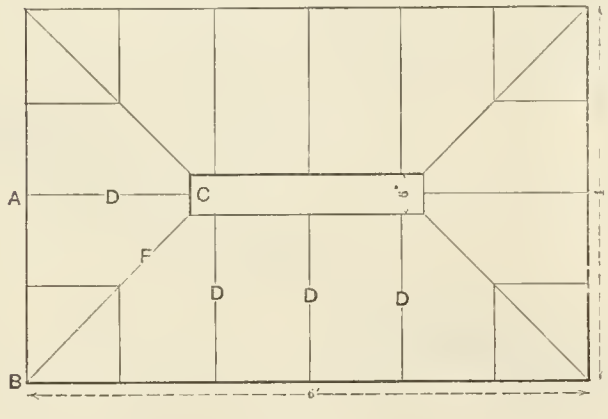


Fig. 5.

THE SANDERS SKYLIGHT CHART.

it represents, we take the sum of two numbers that represent 19½ inches, and added together will give us the length of bar required. For example, let us take any two numbers, as 15 and 4½, which, added together, will give us the length required for the bars D and E, shown in Fig. 4. We find that 15 inches curb measurement on the chart gives us for the length of the hip bar on line B *d* 22⅞ inches, and 4½ inches curb measurement gives us on the same line B *d* 6⅞ inches, and these added together give us 29¾ inches as the length of the hip bar D in Fig. 4. In like manner 15 inches curb measurement on the chart gives us 17½ inches on side bar measurement A *e*, and 4½ inches curb measurement gives us on this same line A *e* 5⅜ inches, which added together give us 22⅞ inches as the length of the side bar E, Fig. 4.

Thus far it will be observed that the length of bar developed has been in skylights with no ridge ventilation. For skylights where there is ridge ventilation, in order to secure the proper length of the center end bar and middle side bars D D D D, as shown in Fig. 5, it is necessary to first deduct the width of the opening for the ventilator, 6 inches, and then take one-half of the balance as the curb measurement. Fig. 5 represents a skylight 4 feet wide, or 48 inches; as the width of the opening for the ventilator is 6 inches, we deduct the 6 inches from the 48, which leaves us 42 inches. One-half of 42 inches gives us 21 inches as the length to be applied to the curb measurement of the chart in determining the length of the bars D D D D. As 21 inches is not represented on the chart, we can take any two numbers that are represented and the sum total of which equals the 21 inches. But when there is not too great a fraction involved it is more convenient to take a number that will go into it an equal number of times. Twice 10½ inches is equal to 21 inches; 10½ inches curb measurement gives us 12⅛ inches on line A *e*; 12⅛ inches × 2 = 24¼ inches, the length of the side bars D D D D. To get the length of the hip bar F shown in ground plan, Fig. 5: 10½ inches curb measurement gives us on the line B *d* 16 inches; 16 inches × 2 = 32 inches, the length of the hip bar F.

As already stated, all measurements for the length of bars on this chart are at the curb line of skylight.

I am aware that all skylight makers do not use the same pitch to their skylights, some preferring one pitch and some another. I desire, therefore, to call attention to the fact that the chart can be readily adjusted to meet all of these conditions and to suit any pitch of skylight required. This is done by lengthening or shortening the lines C *e* and C *d*, Fig. 1, which represent the hight of skylight, accordingly as the pitch required is greater or less than represented on the chart. The lengthening or shortening of these lines, C *e* and C *d*, in now way affects the measuring bars on line A *e* and on line B *d*, except to increase or diminish their length.

The base line, as shown by A B, and which represents the curb measurement of the skylight, can be increased to any length desired. But for convenience in handling as a chart of reference in the workshop it is not desirable to have it too large. I consider a chart with a base line of 2 feet sufficient for all practical purposes in securing accurate measurements for the length of bars in any size skylight, as was fully shown and explained in the description above.

Test of Wire Glass.

At Newark last Tuesday an interesting test was made of wire glass by C. S. Weber & Co. of 415 Broadway, N. Y., sole agents for the American Wire Glass Mfg. Company of Tacony, Pa. In one side of a brick building 7 x 4½ feet inside and 10 feet high was inserted a window consisting of a single pane of wire glass 20 x 84 inches. In the second side was a window 28 x 84 inches and composed of three panes, supported at their meeting edges by iron bars. The third window was 34x 84 inches and composed of four panes whose meeting edges were unprotected. The roof of the building was of sheet iron having a hole in the center. In the fourth side of the building was a small door. An intensely hot fire of tar barrels was started within the structure and in a short time the glass was red hot, when a stream of water was thrown on the three windows. The glass cracked in every direction, but in no case did a piece fall out, the network of wire in the glass preventing this. Neither was there any indication of warping. The test was an unusually severe one and demonstrated that fine wire imbedded in the glass perfectly serves the purpose of holding the glass in position under the most trying circumstances and when it is broken in every part.

FLASHINGS.

The Iron Clad Roofing Company is the name under which T. O'Brien, for a long time connected with the T. New Mfg. Company, has established himself in business at 418 East Twentieth street. Mr. O'Brien makes a specialty of repairing gravel, tile and felt roofs, and is prepared to furnish estimates on all kinds of roofs.

The Globe Cornice Works are a Los Angeles, Cal., establishment, founded by I. H. Hill and J. Hetrick. During the past season they have done the sheet metal work on a number of large buildings. On one, the Bradbury Block, they used 7500 pounds of copper. They are now arranging to put in a machinery plant to manufacture ornamental stamped work.

The Pacific Metal Works will move into the new building which they are erecting for their business at 137–139 First street and 4, 6 and 8 Natoma street, San Francisco, Cal., during the month of January. The house was established by Morrow & Strong in 1876 and a branch in Portland, Ore., in 1882, and was incorporated in 1887. They make a specialty of solder, lead, tin and metals, and deal extensively in tin and terne plates, having their own special brands of roofing plates.

W. F. Berghofer has recently completed a building on Jersey street, near Fifth, Quincy, Ill., for his cornice and galvanized iron works.

The directors of the Canton Steel Roofing Company, Canton, Ohio, met January 9 for the election of officers, which resulted as follows: President, T. C. Snyder; vice-president, Ferdinand Herbruck; secretary and treasurer, Charles Schlaback, and superintendent, T. C. Belding.

At the banquet tendered the National Iron Roofing Association, Charles Aldrich, president of the American Roofing Company, was toastmaster. In that capacity his genius shone as resplendent as it does in conducting the iron roofing business. His remarks in welcoming the delegates were timely and extremely well chosen. Referring to the St. Louis banks during the recent monetary panic, he stated that not one of them suspended, not one of them failed to pay currency as called for, and not one of them issued Clearing House certificates. Referring to the proverbial conservatism of St. Louis, he said it was not that of fear and trembling, but rather the conservatism of prudence and sound common sense. His entire address was an able effort, and while the association has, perhaps, more able orators, it is doubtful if any can say as much in so few words as can the genial president of the American Roofing Company.

In an article on aluminum prepared for the 1892 volume of the "Mineral Resources of the United States," Captain Alfred E Hunt of Pittsburgh says: As yet aluminum sheet has received only a very small use for roofing, but the prospect is that there will very soon be a very large use for the metal for this purpose, when it is furnished in sheet at a rate comparable in price to copper sheet similarly used. It is well in this connection, however, to note that aluminum stands very high in the series as an electro-positive metal, and that when subjected, in contact with any of the other metals, to solutions which are at all corrosive, the galvanic action established is considerable and is, as usual, at the expense of the electro-positive metal, the aluminum. This fact has to be borne in mind in designing new uses for aluminum in connection with other metals, to avoid contacts that will establish galvanic couples.

The Capital Sheet Metal Company, Columbus, Ohio, issue circulars calling attention to Moore's Metal Ceiling, which they manufacture. The firm also make other sheet metal products, besides having a completely equipped corrugating works. On the front page is a half tone engraving of a metal panel ceiling, while the back shows a ceiling and an illustration of the patent dust proof lock joint. The various advantages of this construction are referred to in the interior pages of the circular. The method of connecting the panels is explained and the placing of the metal ceilings is said to be a simple matter. The firm send working plans in every case, showing the spacing of the furring strips and the artistic breaking of the panels. Another circular issued by the same firm calls attention to their standing seam roofing, roll and cap roofing, ridge rolls, V-crimped roofing and siding, corrugated iron, flat or curved, steel weather boards, rock faced steel siding, pressed steel brick, &c.

A copy of a Canadian work entitled "The Shipping Manufacturers' List," a guide to the manufacturers of Canada and their products, by M. J. Henry, Toronto, has been received. The work contains 560 pages, and is designed to be of service to merchants and manufacturers of Canada who are buyers of Canadian goods. A supplement of 48 pages containing the names, business and post office address of all manufacturers in the work is printed in pamphlet form, alphabetically arranged, for use of those in the United States and others who wish to address Canadian manufacturers.

Owing to too heavy shipments to Cincinnati, Pittsburgh coal is cheaper at that center than at home.

STEAM AND HOT WATER.

Ins and Outs of the Blower System.

BY WALTER B. SNOW.

The ins and outs of the blower system in their entirety would make interesting but voluminous reading. It is here intended to merely point out some of the prominent causes that operate to prevent immediate success with this system, and wherever the remedy is not thereby rendered evident, to still further point out the manner of treatment necessary to overcome the existing difficulty.

The very features of the blower system that should make it a success sometimes return, like a boomerang, to retard or prevent its successful operation. Because much is claimed for the system, much may naturally be expected; but to expect that any system can be absolute perfection, and that no matter what the capacity of the man who tends it the system shall be uniform in its action under his varying ministration, is unreasonable. But reasonable or unreasonable, there are plenty of high class buildings in which the system has been installed where its slightest failure to operate satisfactorily is made the subject of serious complaint, without thought that the fault may lie in the man who controls it; while if the same building were heated by one of the numerous furnace systems, the poor janitor or sexton would have to suffer whenever the occupants found cause to complain of discomfort.

In seeking for the cause of complaint with the blower system, investigate first the man who operates it. It goes without saying that he must be experienced. Because a man can sweep floors and shovel coal into a furnace it is no sign that he can run a boiler and a heating apparatus, consisting of motor (steam engine, electric or water motor), a fan, a steam heater and a return water apparatus. It may not call for so much higher grade of intellect, but it is imperative that the man shall know what he is doing when he is operating the system, and that he shall be able to act intelligently upon his own responsibility. In a word, that he must be capable. There is no end to the mistakes of incompetency, and some of them will appear in what follows.

The great fault lies in the fact that school, church and similar committeemen have their *protégés*, their dependents, for whom they must provide places, and qualifications in the majority of cases appear to be the last points considered.

What can be done under proper conditions is evidenced by numerous examples of thoroughly competent men operating the blower system at the same pay as men in similar positions where the furnace system is used.

The blower system is comparatively new, and few men have had actual experience with it, but any man who has run a boiler and has a fair knowledge of the machinist's trade may make himself thoroughly efficient.

When it comes to something going wrong (as is the way with everything with which we mortals have to do) he must have enough mother wit to straighten it out, and not, like one brilliant school house janitor, travel 15 miles to get some one to show him why he couldn't get any water into his boiler. Upon his return with his far sought adviser he had the pleasure of being shown that the sole, and exceedingly simple, reason of his failure was because the valve between pump and boiler was closed. What can you expect with a man of this caliber?

Insufficient Air Supply.

There exists in the minds of many men a strange conception of the medium of heat transfer with an indirect system. Heat seems to be all prominent in their minds, and its medium of conveyance is overlooked. An apartment can be maintained at a given temperature above outdoor temperature only by conveying to that room the requisite number of units of heat. Whether these are to be conveyed in steam or hot water or by means of heated air depends on the system of heating adopted. As with the indirect system, of whatever nature, the steam coils or heated surfaces are all outside the room, air becomes of necessity the medium.

The requisite amount of heat may be transmitted either by large volumes of air at comparatively low temperature or by small volumes at high temperature, but air movement and supply there must be.

Yet in face of these facts we find one of the most frequent causes of failure of the blower system to be insufficient air supply. The large areas and enormous volumes handled are not comprehended by the average attendant, and instances are all too numerous where this is shown to be true.

One man contended in the most obstinate manner that it was heat, not air, that was wanted in his dry kiln. The room in which his apparatus was placed was tight as a bottle, and he immediately entered complaint against the apparatus for insufficient capacity. Adequate air supply immediately quieted his fears.

In similar line a school house janitor was found to be very careful on a cold morning to close the windows supplying fresh air to the fan and to thereby seriously cramp the apparatus when it should work at its best. The ordinary leakage in any building is such that it is practically impossible to shut off absolutely the entire air supply, but it is possible to reduce it to such an extent as to turn success into failure.

There is, nevertheless, in the case of most buildings a time when no air should be taken from out of doors, and that is when it is unoccupied. But in place of drawing the cold air from out of doors the warm air in the building should be drawn back into the fan by opening doors throughout the building and giving free passage from the halls and corridors to the fan room.

Whenever air is taken from above the roof or from a distance, the duct or flue through which it passes must be of ample size to avoid all possible loss by friction.

It frequently happens in the case of a manufactory that when the contract is taken it is distinctly understood that for economy of fuel air is to be taken back from the building in coldest weather, at other times from out of doors. The weather gradually becomes colder. Air is still taken from out of doors, and complaint is made of inadequacy of apparatus without thought of the cause.

Insufficient Steam Supply.

The enormous condensation in the heater of a steam hot blast apparatus demands large supply pipes and plenteous supply. The condensation is, in fact, frequently so great that 1 square foot of surface in the heater condenses as much steam as can be generated by 1 square foot of heating surface in the boiler.

When, by experience, a man has learned, even roughly, of the requirements with direct radiation, he does not always at once grasp the idea that the total surface in a hot blast heater being only about one-third to one-fifth that in a direct system of equal capacity, the condensation per square foot must be three to five times as great. The arrangement of the heater somewhat influences the size of steam supply required. It is possible to so arrange and expose 100 square feet of heating surface in connection with a blower as to absolutely require an inch pipe to supply sufficient steam at 80 pounds pressure, while, with another arrangement, it will supply 300 to 400 square feet.

In buildings of the nature of school houses, churches and halls there is frequently a lack of steam pressure and supply, either through lack of draft, owing to a low chimney, or through lack of air supply to boiler, due to a tight fire room with no free admission of air for the combustion of the coal.

The low steam pressure usually carried in such buildings requires extremely large steam cylinders on the engines employed for fan propulsion, and where 30 to 40 pounds is usually maintained there is certain to be trouble when only 10 to 20 pounds is on the boilers.

Relation of Volume, Speed and Power.

One of the most startling revelations of blower experience is the rate at which power required increases with the speed. The fact is, however, that while the volume of air delivered increases directly with the speed, the pressure increases as the square of the speed and the power as the cube of the speed. For instance, if we were to double the speed of our fan we should deliver twice the volume at four times the pressure with eight times the power.

A manufacturer recently concluded that he would double the speed of his fan by taking off the engine, already direct connected to the fan, and rigging it up to belt to the fan. Nothing has been heard from him since he was informed that his engine as now running

direct connected was developing 8 horse-power, and that in order to drive the fan at twice the speed it would have to produce no less than 72 horse-power.

The Presence of Dust.

As is frequently the case, the blower system is used to great advantage in drying out a building while it is being plastered and finished. Under these conditions there is likely to be in the air drawn through the fan an enormous amount of fine dust, hardly perceptible in the air, but rendered all too evident if it gets a chance to deposit on the wall or ceiling near the opening through which it enters the room. Serious injury may result if due care is not taken. In many cases the admission of this dusty air to the fan room may be prevented by partitions or by the closing of doors. Otherwise cheese cloth or similar screens should be used.

Where dust is always present in the atmosphere permanent screens of cloth, cotton batting, moist clay balls or other approved materials are necessary to properly filter the air. Moistening devices may often be combined to advantage with the filtering arrangements.

If the air supply is taken from the roof extreme care should be exercised to see that by no means smoke from an adjacent chimney may be drawn down the air shaft. In the case of one fine building the chimney had recently to be raised some 30 feet to avoid the complete smoking out of the occupants that occurred when the smoke was blown directly across the top of the adjacent fresh air shaft.

Even the best laid plans may fail. In a beautifully appointed sanitarium the most perfect arrangements were made for the provision of pure fresh air. The ideal, as published in the circular matter of the establishment, was couched in these words: "There are in the immediate rear of the building over 30 private gardens, where grass plots and an abundance of verdure abound, and it is from these gardens, perfectly screened from the dust of the streets, that the pure air is taken and distributed through over 12 tons of galvanized iron ducts, branching like bronchial tubes into smaller ones, forming a perfect labyrinth and network of pipes. Here the pure air, after wrestling with ocean waves and battling with surf and spray, vitalized by sunbeams and scented with the breath of flowers, is borne to every apartment of the 'Palace of Health,' like gentle zephyrs freighted with healing balm." It is not in the nature of things that, even if such a paradise as this once existed, it could long continue; but one would hardly expect to find in the "Palace of Health," only a few months after its doors were opened to the public, that the beautifully tinted walls and ceilings were in many places absolutely ruined by the dust forced in by the hot blast apparatus. Around many registers on light colored walls there was a perfect halo of inky-black dust. When the parties who installed the apparatus were called in to explain the cause of this great fault on the part of their system, what was their surprise to find that, instead of the air going through its startling experience with ocean waves, surf and spray, it was being drawn directly from the boiler room, with all its dust and dirt, and that the nearest approach to the "breath of flowers" emanated from the person of the negro fireman.

Faults in Design.

Of course, glaring faults may exist in the design of the apparatus and system irrespective of the treatment they may receive. One of the most common faults lies in improper proportioning of the distributing pipe, insufficient allowance in areas being made for long runs of pipe, the pipes being made with too sharp bends, the outlets or registers improperly placed, &c. One of the most common errors of the inexperienced is to make all ducts and flues exactly as calculated. For instance, in vertical brick flue work a flue figuring out, say, 30 square inches would be made 4 x 8 inches. In point of fact, a flue figured 4 x 8 inches is likely to have a free area not more than half of this and to have such a rough interior as to cause friction far out of proportion to the exposed surface. An experienced man would make such a flue at least 8 x 8 inches, and very likely 8 x 12 inches. Always work on the principle that it is easy enough to make an opening smaller, but extremely hard and expensive to increase its size in even a slight degree.

Unless small flues can be lined or formed of tile they should be made far in excess of their calculated area. Inexperience is frequently rendered evident by fractional dimensions on round tin and galvanized iron pipe. As such pipe is regularly made in even inches, a pipe should in all cases be chosen having an area greater rather than less than that calculated.

Distribution of Air.

The manner of distribution of air from the pipe or register outlets frequently determines whether the system as introduced shall be a success or a failure. The coldest wall should always be the objective point of discharge from all outlets above head level. Frequently deflectors or diffusers greatly aid air distribution. In high shops it is always necessary that the air should reach the floor as soon as possible.

In the case of offices having low partitions and counters it is frequently impossible to heat certain portions. The trouble will be found to lie in the fact that the air, being delivered from above head level into these spaces, has no opportunity to return along the floor on account of the obstructions. The placing of openings in the partitions at floor level will usually overcome the difficulty, but it sometimes becomes necessary to carry to each apartment a separate pipe just as though it was a separate room.

Continuous Operation.

Stopping the fan is in many arrangements equivalent to shutting down the entire apparatus. But in buildings where flues lead upward almost directly from the apparatus there will often be sufficient circulation of air through the heater by natural agencies to go far toward keeping the rooms warm above. But the blower system must be considered in the same light as the direct steam or furnace systems—it must be operated continuously while the building is occupied. A properly drawn contract should specify that the apparatus must be operated continuously. A misunderstanding of this fact sometimes leads to at least disagreeable results.

In a certain hospital there was installed last fall an arrangement of the blower system guaranteed to heat the building to 70° in zero weather when operated continuously and supplied with sufficient steam. It was in use during a part of the winter as a means of drying out the plaster and keeping the rooms comfortable for the workmen. But it was shut down nights, and at times was run intermittently. Many doors and windows were continuously open, everything was damp and a greedy absorber of heat. As a very natural consequence, 70° could not be maintained throughout the building, and the system was declared inadequate. Yet the system as a whole had never been given a fair show. It was installed in a building where it was necessary to run continuously to maintain an even temperature day and night, and yet because it failed to reach that temperature during the day, after the building had been completely cooled down by stoppage over night, the system was declared a failure.

Nothing but common sense will ever clear up such matters. It was in this same building that, in order to make a test after warm weather came on, it was proposed by the architects that the contract should be considered as filled if the building could be heated to 106° with outside air at 60° instead of heating from 0° to 70°. They couldn't see that while the latter was feasible the former was impossible of accomplishment with the given apparatus (the air supply remaining constant) because the heater was not deep enough in rows of pipe to heat the air to the temperature necessary to maintain 106°.

Effect of Moisture in Ducts.

The presence of moisture in underground brick or tile ducts is a source of constant trouble which can always be avoided in the original construction—that is, so far as the moisture due to leakage into the duct from the surrounding soil is concerned. But this is not the only cause of moisture, as is evidenced by the following experience:

A certain system was found last fall, upon starting up, to cause a deposit of moisture on everything within the mill. Walls, windows and machinery were reeking. The system was condemned *in toto*, and the party who installed it was not even asked to point out the cause. On the other hand, an "expert" proved (?), to the satisfaction of the mill agent, that such a deposit was the natural result of the operation of the blower system. The party who installed the system, happening to hear of the trouble, called upon the parties and asked an opportunity to investigate. This was accorded, but with the assurance that it would do no good, as the system had proved itself a failure.

Nevertheless, the removal of a manhole cover from the underground duct was followed by the discharge of clouds of steam. Investigation then showed that a steam pipe had burst in or near this duct and steam was pouring into it. The bottom of the duct was covered with several inches of water. The cause was clear, the remedy was simple and the system was soon in successful operation.

Character of Attendants.

This brings us back to our starting point—intelligence of those who operate the system. The very apparatus in the above case showed by its filthy and unkempt appearance the character of the man who tended it, and it, after all, was not so surprising to find that so simple a cause for the difficulty should have been overlooked, in fact, unsought by him. And this, too, in a manufactory where mechanical ability and ingenuity are expected to be present at their best.

We can blame such a man more than we can criticise the ignorance of the hot blast attendant, who, with lack of oil and excess of speed, melted the Babbitt out of his engine boxes, and then related

that the first thing he knew the solder all ran out of the bearings.

There must be on the part of the attendant the simple ability to operate the apparatus and then a clear conception of the principles governing the operation of the system; how he must operate it to secure a certain result; what he must do to overcome a certain difficulty. In a word, he must know "the ins and outs" of the system.

Lily Steam and Hot Water Heaters.

Rubel & Co., 114 and 116 Lake street, Chicago, who have for several years manufactured the Lily wrought range and other specialties, have added a new department. They have brought out the Lily steam and hot water heaters. The Lily steam heater is a magazine construction, of which four sizes are built as single heaters and four sizes as twin heaters for use in heating very large buildings. Magazine feed hot water heaters are made in the same sizes as the single steam heaters, and door feed heaters in eight sizes, thus covering a very wide range of conditions and capacities. The steam heater is intended for low pressure heating, and consists of annular sections encircling the central magazine, with passages between the sections to permit the free play of the products of combustion. The hot water heater is constructed with a water chamber surrounding the fire pot into which the return pipe opens, while above the fire pot are a number of horizontal sections containing circulating plates which compel the water to flow through three chambers in each section, and thus become thoroughly heated on its upward passage to the outlet pipe. The smoke flue alternates on the right and left of each section, giving the products of combustion full play on the entire surface of each on the way to the smoke pipe. A great extent of heating surface and compactness of form are thus secured, while externally the heater presents a very handsome appearance. Automatic temperature regulators are furnished with each hot water heater.

HEATING NOTES.

Curtis & Curtis, Bridgeport, Conn., issue an illustrated catalogue and price-list of their pipe threading and cutting machinery. In an introductory address to the trade the advantages of their pipe threading and cutting machinery as compared with the old fashioned style of stock and die are presented. This is followed by a recapitulation of the principal advantages of their machines. Mention is made that these machines have been entirely remodeled. The first goods noticed are Forbes patent die stocks of various sizes and styles, running up to hand and power machines capable of cutting off or threading pipe from 2½ to 8 inches. This is followed by power pipe cutting machinery of various designs and styles, and the Curtis patent pipe threading attachment for lathes is illustrated and described. Then come a variety of smaller goods, nipple holders, die stocks, pipe vises, ratchet drills, pipe wrenches, pipe tongs and dies and nut taps. At the end of the volume is a long list of extracts from testimonial letters that have been sent by prominent concerns.

Timothy Holland of Chicago, Ill., has assigned to the Holland Radiator Mfg. Company of that city a patent for an improvement in radiators, the invention relating to a simple means for compactly connecting the separate loops.

The Nashville Machine Company, Nashville, Tenn., distribute to their friends in the trade a handsome wall calendar, at the top of which is an engraving of a famous painting by Schweninger. In the middle of the card are views of the G. & J. R. Bolton improved hot water heater, while at the bottom is the calendar.

Harvey Blank, the junior partner of the firm of Blank & Son, steam fitters, Pottsville, Pa., has decided to start in business for himself. He will locate at Minersville and will conduct the machine branch of the business.

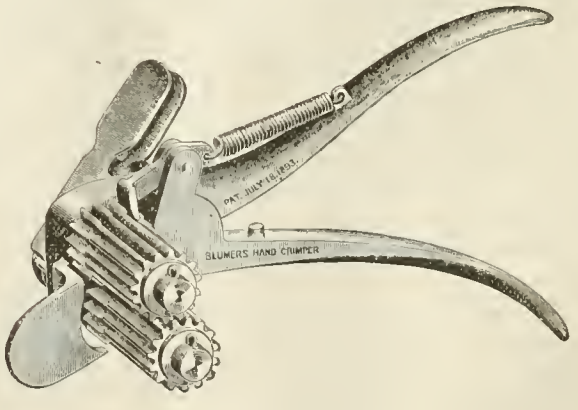
The Herendeen Mfg. Company, Geneva, N. Y., have moved their New York office to 46 Taylor Building, at 39 and 41 Cortlandt street, where the welfare of the Faultless Furman boilers in the vicinity of New York will be looked after by J. G. and A. H. Dudley, managers.

J. F. Stephenson, Lakewood, N. J., is one of the large heating contractors of his State, and has installed many successful plants for both hot air and hot water, using the Novelty furnaces and circulators.

A new shoe company at Dolgeville, N. Y., will erect a three story factory and office building, 44 x 187 feet, and it is said that the latest appliances for heating and ventilating will be supplied. The capital stock is $300,000, and Alfred Dolge, one of the directors, is the prime mover in the enterprise. W. R. Green is president and Edwin H. White secretary and treasurer.

Blumer's Hand Crimper.

Peck, Stow & Wilcox Company, 27 Chambers street, New York, are marketing the hand crimper here shown. It has been brought out largely for use by the tinner or sheet iron worker, especially when out on a job or away from the shop, where crimping in quantities is usually done with a machine. It will be found convenient for crimping leader or stove pipe. It is 7½ inches long over all, with gears ⅞ inch in diameter and 1¼ inches long. Beyond the gears is a double thumb piece with ratchet, by means of which the gears are separated so the metal can be inserted. By raising the lever to the position indicated or any one of three degrees of pressure provided for, the tool is ready to crimp. This is accomplished by pressing the handles together, revolving the gears two teeth at a time. The coil spring simply raises the upper handle after being pressed down. The gauge at the end is a part of the upper handle and perfectly rigid.



Blumer's Hand Crimper.

The Crown Index Sight Feed Oil Cup.

The Crown cup is provided with an index device for regulating the flow of oil, and an indicator arm turning on the lid to mark the notch giving the required feed. When desired the feed can be instantly turned off, and on again by replacing the index lever in the notch of the indicator arm. When the index arm is closed the lever can be left to stand up out of the notch, thus acting as an indicator to show from a distance that the feed is shut off.

The Crown Index Sight Feed Oil Cup.

Where a number of cups require different feeds, this can be accomplished with this cup without losing the original feed by simply moving the indicator arm a few notches to the right, and when the established feed is again required it is only necessary to replace the arm in the index slide which marks the required feed. These cups are made of cast brass by the Lunkenheimer Company, of Cincinnati, Ohio, in sizes holding from ⅝ to 18 ounces of oil.

There were 4132 fires in the city of New York last year, the estimated loss from which was more than $5,600,000 over and above that covered by insurance.

TIN PLATES.

Meurer Bros. Company's New Tin Plate Works.

Apparently undaunted by the chance of tariff revision, Meurer Bros. Company of Brooklyn, N. Y., are rapidly pushing the construction of their new tin plate manufacturing plant at 575–577 Flushing avenue in that city. The building which has been erected for this purpose adjoins the former premises of the firm, and is situated on a lot 50 x 95 feet in area, which it entirely covers. It is constructed on a very substantial scale, and will be entirely fire proof. The thick walls are of brick, with iron spans and girders, covered by a corrugated iron roof. The latter will be put on immediately, and skylights reaching the entire length of the shop will be fitted, giving ample light and ventilation. A floor of concrete is about to be laid down, so that there will be absolutely nothing in the structure of an inflammable nature. The shop is of unusual hight, reaching above the second story of the adjoining buildings. Foundations have been laid for six large tinning pots, to be ranged along the west side of the building. Two Phillips tinning machines are already delivered and will be installed very shortly. Four more are ordered and will be put in place as soon as received. Refining furnaces for the production of stereotype and Babbitt metal, &c., will occupy a portion of the remaining space, together with the other requisites of a tin plate plant. Ample space will be left for the insertion of additional tinning pots as requirements arise. The capacity of the works when in full operation will be about 2000 boxes weekly, and Messrs. Meurer propose embarking at once in the manufacture of a full line of both bright and roofing tin. Their standard brands of terne, which are already well known to the trade, namely Meurers' Roofing, Pullman and Flushing, will of course form the bulk of their output at first. Unless the severity of the weather or other causes interfere with the work, the firm hope to have their tin plate works in operation by the middle of February.

SCRAP.

We are indebted to the United States Iron & Tin Plate Mfg. Company, Demmler Station, Pa., for a copy of a poster table they are issuing as a New Year's souvenir. The table measures 9¼ x 12½ inches and is figured so that the user can quickly determine the price of various sizes of tin plates where the price per box of 14 x 20 is given as a basis, and where there are an equal number of sheets to a box. The first vertical column gives the number of square inches in sheets of different sizes, the second giving the dimensions of the sheets from 14 x 20 to 20 x 28. In all 43 different sizes of plates are given, including these limits. Then follows the table proper, with the prices of these 43 plates figured on a varying basis of the 14 x 20 plate. A range of prices is given varying 10 cents a box from $4.50 to $9. The use of the table is very simple. It is required to know the price of some odd size of tin plate on a basis, say, of $6.10 for a box of 14 x 20. Running along the top line until the number $6.10 is reached, descend that column until opposite the size of plate required. The intersection will give the price of the box of the odd size. An extra line also gives the price per square inch, so in case a plate is an odd size and it is not convenient to average up from the two nearest sizes, the figuring can be done on the basis of the number of square inches in the plate. Of course the table can be worked in the reverse manner. Knowing the price of an odd size plate it is easy to determine the corresponding price of a standard plate. The table is clearly printed and ruled in red. Below the table are brief references to the plates made by the United States Iron & Tin Plate Mfg. Company, also table of the weight per square foot of the different ganges of tin plates and corresponding number of United States standard gauge. The top of the poster carries a reference to the United States Iron & Tin Plate Mfg. Company, printed in patriotic style. Uncle Sam and Columbia are represented, while in the background the British lion is retreating and the Welsh goat is succumbing to the attacks of the American eagle.

The branch store which Merchant & Co. of Philadelphia established last year at 584 Flushing avenue, Brooklyn, N. Y., has proved a marked success in attracting the trade of that city and of Long Island generally. It is very favorably situated on one of the busiest business thoroughfares of Brooklyn, and the striking signs displayed on the exterior do not fail to catch the eye of the passer-by. The facilities provided for the reception and shipment of goods are excellent, and ample storage room is contained on a floor space of 80 feet square. In addition to a large stock of bright and roofing plates, sheet iron, zinc, sheet copper, metals, &c., a full line of tinners' and roofers' supplies is maintained in stock. This latter feature is said to be particularly appreciated by the local trade. Messrs. Merchant's New York manager, C. E. Bolles, has also charge of their Brooklyn branch, to the interests of which he is devoting great attention.

Evidently all the Welsh tin plate manufacturers are not discouraged by the existing depression in their trade, for we read in the English papers that four extra mills are being laid down at the Gwendraeth Tin Plate Works, Kidwelly.

With the compliments of Meurer Bros. Company, 575-577 Flushing avenue, Brooklyn, N. Y., we have received an attractive little souvenir paper weight, cast in block tin, which that well-known firm of tin plate and metal dealers are distributing to their friends. The weight takes the form of three boxes of Meurer's guaranteed brands of terne plates, carelessly piled and accurately reproducing the markings of the originals. Each box bears the name of one of their brands of roofing plates—namely, Meurer's Roofing, Flushing and Pullman, with the announcement that each sheet is stamped and squared.

Tin Plate Report to September 30, 1893.

The quarterly report on the production of tin plates in the United States for the quarter ended September 30, 1893, transmitted by Colonel Ira Ayer, special agent of the Treasury, was promulgated from the Department this week. It shows that the total product of tin and terne plates by 35 reporting firms was 27,145,480 pounds, as against 39,543,587 pounds during the previous quarter. Of this output 8,794,027 pounds were made from American rolled black sheets. In addition, the quantity of American sheet iron and steel made into articles and wares tinned or terne plated was 1,052,813 pounds; so that the total production for the quarter, subject to comparison with net imports, under Secretary Carlisle's ruling of the act, was, including the last named amount, 9,257,610 pounds. The aggregate output for the quarter from all sources was 28,198,293 pounds. Of the output of commercial plates, 13,861,317 pounds were coated with tin and 13,284,317 pounds were terne coated, as compared with 20,748,427 pounds and 19,425,336 pounds respectively in the June quarter, so that the relative proportion of each has been well maintained. Nearly 96 per cent. of the commercial plates belonged to the lighter class. The production of black plates in the United States during the September quarter was 11,355,368 pounds, against 29,988,513 pounds in the previous quarter. Of the 35 tin plate manufacturing concerns making sworn returns, 28 used American black sheets wholly or in part, and the aggregate consumption of such sheets in the various forms of tin plate manufacture was equal to 86 per cent. of the entire production. In the June quarter the proportion was 82 per cent. of the entire production.

The crop estimates of the United States for the year 1893, as just completed by the Department of Agriculture, give the following figures for some of the leading agricultural products:

	Area in acres.	Yield. Bushels.
Corn	78,938,465	1,619,496,131
Wheat	34,629,418	396,131,725
Oats	27,273,033	638,854,850
Barley	3,220,371	69,869,495
Potatoes	2,605,186	183,034,203
Tobacco	702,952	Lbs, 483,023,963
Hay	49,613,469	Tons, 65,766,158

The above figures show a falling off from the figures for 1892 in every class of crop.

The Pacific Coast has not escaped the general industrial depression. At Portland, Ore., 63 per cent. of the wage earners of the city are reported as being out of employment at the present time.

THE RETAIL STORE.

The Hardware Club and the Hardware Dinner.

As announced in our last issue, it had been determined to hold the usual dinner of the Hardware trade on the evening of February 27. Our readers will therefore be surprised to learn that the Board of Governors of the Hardware Club, at a meeting held January 12, decided without a dissenting voice to reconsider this decision and give up the dinner this year. Their action is shown in the following preamble and resolutions adopted at that meeting:

Whereas, there is at the present time much distress among the working classes as the result of the disturbance of business during the past year, and as a consequence many appeals for charity are being made; and

Whereas, it is desirable that on the occasion of the opening of the club rooms in the Postal Telegraph Building, which will soon be completed and ready for occupancy, there should be a suitable reception or banquet for the members of the club and their friends in the trade: therefore

Resolved, That the annual dinner which it was decided should be held on the evening of February 27 next be deferred or given up, and that in its stead there be, when the club comes into possession of its rooms, a suitable formal opening which will bring the members of the trade together and serve many of the purposes of the usual annual dinner.

Resolved also, That the Board of Governors recognize the earnest call which is made upon them and upon the trade at large for the relief of the existing distress among the industrial classes through the channel of individual liberality, which will in their judgment be facilitated by dispensing this year with the usual dinner, and each devoting the expense of the same to charitable purposes.

The trade generally will recognize the force of the considerations which led to the above action, which we are confident will meet their hearty approval, in view of the fact that there is much want among the working classes, not only of New York, but of other manufacturing points.

Alaska Refrigerator Trap.

The accompanying cuts represent a new zinc trap used in the refrigerators of the Alaska Refrigerator Company, Muskegon, Mich. The trap, as shown in Fig. 1, measures 2¾ inches over all, and is placed in the provision chamber just beneath the ice chamber, where it may be easily reached to remove when necessary to clean. The waste water from the melting ice is obliged to rise in the center corrugated cup above the bottom of the lower end of the upper waste pipe, shown by dotted lines in Fig. 1, before it can overflow, thus preventing outside air ascending the waste pipe. It is explained that the shape of the corrugated cup is such that the overflow will follow down the outside to its point and drop through the center of the lower waste pipe; also, that

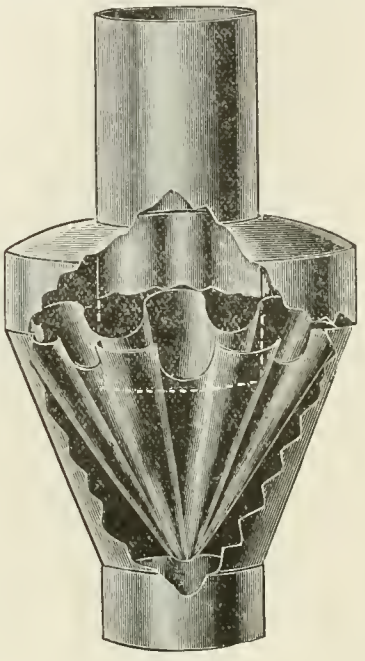


Fig. 1.—Alaska Refrigerator Trap.

the cup keeps the water away from the outside shell, so that no moisture will collect on the outside of the trap.

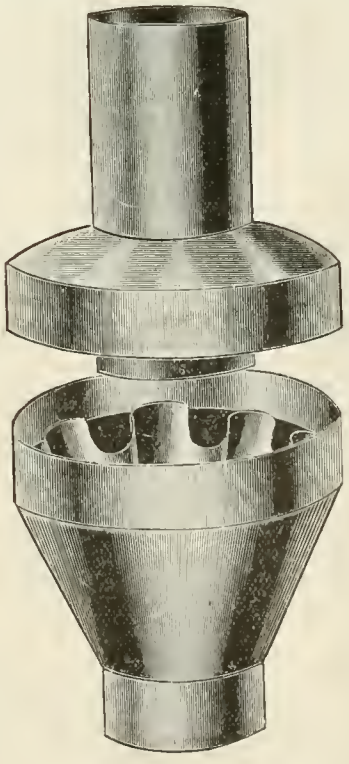
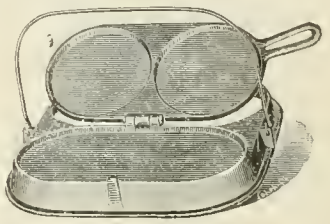


Fig. 2.—The Two Parts of Trap.

The manufacturers state that the waste pipe is made straight, and that by removing the ice rack a stick can be run through the pipe, cleaning off all deposit that may collect.

Patent Cake Griddle.

The Wagner Mfg. Company, Sidney, Ohio, have put a cake griddle on the market, as illustrated herewith. These griddles are made in two sizes, for baking four or eight cakes at once, the one shown being the four cake size, which

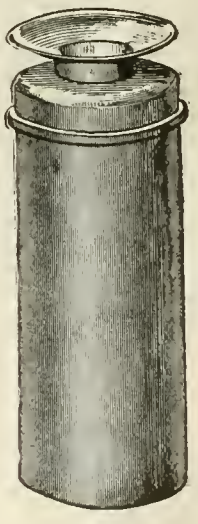


Patent Cake Griddle.

is especially adapted to gasoline stove use. Both sizes have raised bottoms allowing the heat to circulate freely and equally under all parts of the griddle. Either size may be used on any sized stove, with or without removing the lids.

The S. & P. Milk Can.

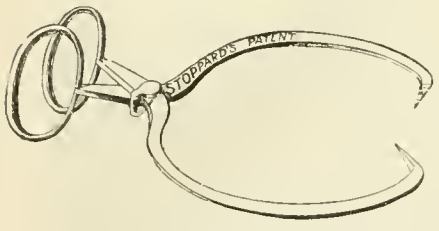
The Stuart & Peterson Company, Burlington, N. J., have just brought out the milk can shown in the accompanying cut. The can is porcelain lined and has no seams, and, it is claimed, is indestructible. It is explained that repacking is avoided by the use of the can, making a great saving in ice, and that unpleasant odors so common to tin cans are overcome. It is further explained that tin cans collect filth in the seams and that the solder causes sour milk, also liability to decomposition and poison. The can is made to contain 40 quarts, with detachable top for cleaning. It is designed for use in milk depots, hotels, restaurants, eating stands, &c.



The S. & P. Milk Can.

Safety Ice Tongs.

T. G. Ellsworth, 85 Chambers street, New York, agent for Robert Stoppard, Auburn, N. Y., is introducing Stoppard's Safety Ice Tongs, as shown herewith. The safety stop is placed upon the tongs at the point where they are riveted together, to prevent them open-



Safety Ice Tongs.

ing too far, serving as a protection to the hand of the operator and increasing the durability of the tongs, it is stated, at least one-half. The point is made that the stop does not increase the cost of the tongs. The tongs are made in four sizes : 14½, 16½, 24 and 26 inches.

The Jewel Lawn Sprinkler.

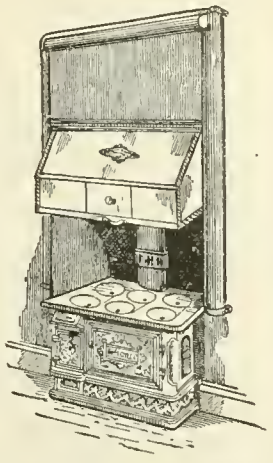
The accompanying cut shows a lawn sprinkler offered by the Detroit Sheet Metal & Brass Works, 64–72 Orleans street, Detroit, Mich. The distributing channels of the sprinkler are

The Jewel Lawn Sprinkler.

referred to as large, having no possible chance to clog up. It is stated that it will sprinkle a diameter of from 2 to 40 feet, according to the water pressure; also in a half circle. A full circle is obtained by turning the small thumb screw to the left, and a half circle by turning it to the right. Attention is directed to the carriage as being adapted to most of the sprinklers manufactured, and as being found convenient in moving the sprinkler on the lawn as desired without being obliged to shut off the water. It can be moved by the aid of the hose or of a cord attached to the carriage.

Heat and Odor Extinguisher.

The illustration herewith shows an attachment for coal and gas ranges that is being manufactured by the Heat & Odor Extinguisher Company, 525 West



Heat and Odor Extinguisher.—Fig. 1.—Open to Use Top of Stove.

Twenty-third street, New York. It is an adjustable hood with a fire proof curtain which works on a roller so that the hood can be suspended at any desired point. It forms a protection against much radiant heat, and serves as a flue to carry off both heat and the fumes of cooking, making a good kitchen ven-

Fig. 2.—Closed to Prevent Heat Escaping.

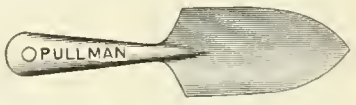
tilator. It retains the heat when down for the benefit of the cooking and protects the vessels from cool currents. The difference in the temperature in the summer from the use of the extinguisher is said to be several degrees, and enough to establish appreciable comfort. Fig. 1 shows the extinguisher raised so the top of the stove can be used, and Fig. 2 shows it closed.

Improved Freezers.

The North Bros. Mfg. Company of Philadelphia, Pa., have made what is claimed to be an important improvement in their line of Ice Cream Freezers. The improvement is to be found in the hoops of the pails of the Shepard Lightning Freezer, which they are now making, having acquired the freezer business of the Shepard Hardware Co. The hoops are made of galvanized wire, welded by electricity, and are embedded by a patented process in grooves made in the pail, thereby securely clamping the staves and making it impossible, it is claimed, for the hoops to fall off or be forcibly removed without injury to hoops or pail. Wire hoops, it is claimed, possess many advantages over the ordinary riveted flat hoops ; expansion of the wood cannot break them, and they will not stretch ; being round, only a small portion of surface is presented to the pail ; therefore, when the pail swells the hoops tend to compress the wood and cause the pail to retain its original size. The claim is also made that the electrical process of welding used in the manufacture of the hoops conduces to a better and stronger joint than is possible by any other method.

Pullman Malleable Garden Trowel.

Pullman Sash Balance Company, Rochester, N. Y., are introducing a trowel as shown herewith. It is made



Pullman Malleable Garden Trowel.

in one piece of malleable iron, thus avoiding the use of wood handles and the necessity of riveted blades. The manufacturers refer to the trowel as nicely polished, unbreakable, self sharpening and self cleaning.

MEMORANDA.

THE HAUPT STOVE & HEATING COMPANY is the name of the successors to the firm of Haupt & Becker, doing business at 619–621 West Market street, Louisville, Ky. The new firm will continue the business at the old stand and will carry a complete line of stoves, ranges, furnaces, house furnishing goods, &c. Their shop is equipped in all its different departments with the latest improved machinery and has excellent facilities for doing work on short notice.

A CIRCULAR, issued by Foster & Keach, Table Grove, Ill., illustrates and describes the Dimond Jo adjustable flue stop, which they manufacture. This stop is applicable to flues or thimbles of different diameters, and is claimed to give double protection against the smoke and fits so firmly as to prevent any accidental displacement.

IT IS STATED in the English trade journals that one result of the late coal strike in Great Britain was a largely augmented demand for oil and oil burning appliances for lighting, warming and cooking. The hardware and house furnishing goods dealers of the country who were sufficiently wide awake to foresee and provide for the demand are said to have reaped large profits. The use of oil apparatus is likely to continue for some time, as the price of coal is still very high on the other side.

One of the most powerful electric search lights yet constructed is to be mounted at Sandy Hook for coast defense purposes.

The landing agent at Ellis Island, New York, gives the number of steerage passengers landed there during last year as 364,700. In the same time 121,829 cabin passengers were landed in the port of New York by the various steamship companies.

STOVE TRADE NOTES.

The Bethany Mfg. Company

have started a new enterprise at Bethany Heights, a suburb of Lincoln, Neb. The company have a capital of $100,000 and will manufacture the Wells steel furnace and ventilating appliances, invented by George A. Wells. For six years the Wells furnaces have been successfully manufactured at Oskaloosa, Iowa, and to secure enlarged territory and to enlarge the plant came the relocation at Bethany Heights. The company now have completed, ready for machinery, on the grounds adjoining the Missouri Pacific siding at Bethany, a foundry and machine shop 61 x 157 feet in size, built in the most substantial way, brick veneered, with high basement. The cost of the building is $5500, and the machinery that will be shipped and placed in position at once will invoice in value $30,000. In addition to the manufacture of furnaces the company will be fully equipped to make castings and to do general iron work for the trade. They will employ 40 men, some 15 of whom will move from Oskaloosa with their families to Bethany Heights. They can at any time increase their working force with present capacity to 60, and can, in addition to general work, turn out annually 500 furnaces complete. The Wells furnace is adapted to either hard or soft coal, operates on the down draft principle and, it is said, makes no smoke. The incorporators of the company are J. Z. Briscoe, D. R. Dungan, W. P. Aylesworth, J. M. Borland, H. D. Hendryx, S. L. Wright, L. H. Babcock and J. G. Cordner. H. D. Hendryx is president and George A. Wells is superintendent.

The Dakota Hay and Straw Stove Company,

Webster, South Dakota, are manufacturing a cooking stove designed to use hay or straw. The stove has been specially designed for cooking, in which respect it is claimed to differ from all other hay and straw stoves which have thus far been brought out. In appearance this stove resembles the old-fashioned step cook stove, with its low hearth, four cooking holes on the next step and high oven in the rear, from which the smoke pipe ascends. A radical difference, however, is seen below the oven and cooking holes. A metal cylinder extends from the rear of the stove to the front under the hearth plate. This is intended to contain the fuel. A loose cylinder, called the feeder, is used. This is filled with hay or straw, pressed in tight with the hands. The feeder, when filled, is pushed into the stove cylinder through the rear. Cross bars on the bottom of the feeder catch on hooks on the side of the interior of the stove. The feeder is pulled out by means of a cross bar on the end of it, the fuel remains in the stove, the door is shut and the stove is ready for use, while the feeder can be charged for another filling. The fire is started from the front of the stove and is stated to produce a strong heat and as pure a flame as dry maple or hard coal. The draft is regulated by a damper. A notable feature is that a 7-inch pipe is recommended for carrying off the smoke. Bales or bundles can be used in place of the feeder. The stove is principally made of cast iron and is stated to be durable in construction.

ODD PLATES.

A PRESS DISPATCH announces that the Keeley Stove Company's works, Columbia, Pa., resumed operations in all departments on January 17.

GEORGE M. CLARK & Co. of Chicago, Ill., state that in spite of the doubt and uncertainty in the minds of buyers they have now more orders on their books for future delivery than ever before at this season. The company explain this on the ground that they believed trade could be obtained if they sought it, and the results have confirmed their belief. Their interests will be looked after the ensuing year by the following traveling salesmen, who will cover the territory named: W. C. Bissell, Chicago and vicinity, Texas and the extreme East; Edward Lange, Minnesota and North and South Dakota; J. C. Buckley, Central and Southern Illinois and Southern Wisconsin; A. F. Millikan, Northern Illinois and Iowa; George E. Harris, Michigan; C. T. Mason, Indiana; J. H. H. Clarke, Ohio, and W. J. Queeny, Missouri.

THE ART STOVE COMPANY of Detroit, Mich., have just finished the patterns for a new Franklin stove, which is said to embody many interesting features. The design is something of a departure from the usual run of goods of this class, and the manufacturers feel that the stove will be able to strongly compete in every way with anything at present on the market.

THE BRIDGE & BEACH MFG. COMPANY of St. Louis, Mo., Portland, Ore., and San Francisco, Cal., have issued a pamphlet giving a long list of testimonial letters relative to the Superior Air-Tight Oak stove. This heater has a large air tight base, capacious ash pan, drop smoke door, and the mounting is said to be done without the use of bolts or rivets, thus making repairs easy. The company state that they have hundreds of testimonials from dealers selling this stove, praising its operation and assuring the makers of largely increased sales in 1894.

AT MINNEAPOLIS, on the 10th inst., Judge Mahoney dismissed the cases of J. M. Boyd and A. R. McGilvery, charged with the embezzlement of $6000 from the Cleveland Co-operative Stove Company of Cleveland, Ohio. They were local agents for the company and were arrested on November 17 last, but the prosecution failed to develop the charge.

A. L. CANFIELD, the New York representative of the Danville Stove & Mfg. Company of Danville, Pa., has issued circulars announcing that his company have secured control of the Monarch line of gasoline stoves for the coming season. Among the superior points referred to are the lay down tanks on all junior stoves, some new lines of the junior patterns and the new process stoves and ranges which are said to be entirely new. It is also stated that the company intend to add to their line a number of new parlor stoves and ranges this year. Among the new ranges is a high grade six-hole construction, a new four-hole stove and a new low priced six-hole stove. In due season representatives of the company will visit dealers in the surrounding country in the interests of the goods named.

WILLIAM MACKEY & SONS, proprietors of the South Haven Stove Works, South Haven, Mich., closed down a short time ago for the usual inventory and repairs. It is their expectation to resume in all departments some time this month.

THE CLEVELAND FOUNDRY COMPANY, of Cleveland, Ohio, have issued a calendar for the new year in the shape of a poster bearing a large view of the Puritan lamp stove. This construction is referred to by the manufacturers as being warranted not to leak, has no seams and no joints, and the casting is in one piece. The picture of the stove is printed in colors to represent the different materials employed in its manufacture, the mica light being covered by the leaves forming the calendar proper.

THE BAXTER STOVE COMPANY of Mansfield, Ohio, have issued a very pretty little folder for the season of 1894, calling attention to the Monarch New Method gasoline stove, made in four sizes, and the Monarch Cabinet range, which is referred to as being "chief among ten thousand." The first page or cover of the folder is embellished with an embossed design in colors and bearing the inscription, "The two stars of the Monarch line." It is also announced that the Danville Stove & Mfg. Company of 284-286 Pearl street, New York, are agents for New York, New Jersey, Pennsylvania, Connecticut and Western Massachusetts.

THE UNION STOVE LINING COMPANY of Weir Village, Mass., are distributing among their friends in the trade a very pretty calendar for the new year. A striking feature of the ornamentation is a likeness of Lillian Russell, the well known queen of light opera.

THE GEM CITY STOVE WORKS, Dayton, Ohio, resumed operations last week after a brief shut down.

THE CHANNON EMERY STOVE COMPANY of Quincy, Ill., are said to have at present about 100 men at work in their various departments, and during the coming year some slight improvements in plant are contemplated.

THE FOLLOWING TRAVELING SALESMEN will represent the Bridge & Beach Mfg. Company of St. Louis, Mo., during the year: R. S. Buck in California; L. M. Dyer in Oregon and Washington; L. H. Booch in West Texas, Indian Territory and Oklahoma; J. R. Henry in East Texas, Arkansas and Louisiana;

E. H. Clayton in North Missouri; F. A. Goetz in South Missouri; B. C. Arand in Illinois; A. Weiskirch in Northern Kansas and Nebraska; R. J. Guthrie in Southern Kansas, and A. E. H. Van Sittert in Iowa.

THE VICE-PRESIDENT of the Thomas White Stove Company, Quincy, Ill., in an interview with the representative of a local paper states that the additions which the company have made during the past year in the way of new buildings and new machinery have led to an increase in the working force of 33⅓ per cent., which is certainly an encouraging showing.

THE HOWARD STOVE COMPANY of Beaver Falls, Pa., expect to resume operations with a full force about February 1. They would start earlier but have been delayed somewhat in getting out the new patterns for a range and cook stove which they will offer the trade this season. They report the outlook as fair and expect a steady run.

THE PALERMO MICA COMPANY, with office at 27 Peck Slip, New York City, have recently issued an announcement to stove manufacturers and hardware jobbers to the effect that S. T. Peckham, formerly of Utica, N. Y., has become associated with them in the mining and selling of mica, and will act hereafter in the capacity of general sales agent. The company state that they have greatly improved facilities at their mines for the careful handling of their product and that, as their business is exclusively in mica, they are enabled to give it undivided attention.

THE BRIDGEPORT STOVE WORKS is the name of the concern recently organized at Bridgeport, Ala., for the purpose of carrying on the business of stove manufacture. For the past two years E. H. & B. J. Lowman have been successfully manufacturing stoves, and demonstrated that the business may be profitably carried on in that place. In order, however, to secure sufficient capital to keep the works running full capacity, it was recently determined to form a company with a capital of $25,000. This was done, and the following Board of Directors chosen: E. H. Lowman, B. J. Lowman, T. R. Patterson, C. Douglass, R. P. Patton, Virgil Boulden and J. M. Bender. At a meeting of the Board of Directors E. H. Lowman was elected president, B. J. Lowman, vice-president, and C. Douglass, secretary and treasurer.

WE UNDERSTAND that the business of the Syracuse Stove Works, Syracuse, N. Y., for 1893, showed a decided increase over 1892, and that a satisfactory return was made to the company's stockholders.

AT A RECENT MEETING of the stockholders of the Auburn Stove Foundry Company, Auburn, Maine, H. W. Hutchins was elected president, Thomas H. Roberts, treasurer, and George C. Wing, clerk. These, with A. L. Goss, S. Record, Cyrus Greeley, Hampden Fairchild, George McFadden and J. R. Learned, constitute the Board of Directors.

THE OHIO CRUDE PETROLEUM OIL STOVE COMPANY, Ironton, Ohio, have been incorporated, with a capital stock of $200,000. The incorporators are J. D. Foster, C. A. Hammel, W. M. Kerr, H. A. Marting and Louis E Marting. W. M. Kerr is president of the company; H. A. Marting, vice president; Louis E. Marting, treasurer; J. D. Foster, secretary and general manager, and C. A. Hammel, assistant manager. The company have been organized to manufacture the oil heating and cooking stoves recently patented by Messrs. Foster and Hammel.

H. P. GINRICH, who, in connection with Wm. Straube, represents the Ringen Stove Company in Illinois, paid the home office a visit during the past week. Mr. Ginrich reports an excellent trade in Quick Meal gas and gasoline stoves, and in visiting 32 towns in Illinois during the past ten days, succeeded in booking 32 orders.

THAT there is atill some humor left in the trade, notwithstanding the present condition of business, is evidenced by the letter received by the Excelsior Mfg. Company, St. Louis, a few days since, from which we print the following extract: "During the long rest entailed upon us by anow, anti-silver and tariff legislation, we think of opening a game of 'draw,' with a 'limit' to suit the times. Enclosed find 35 cents, for which please aend us a package of your playing cards by mail. N. B.—No cold decks, please."

GEORGE W. BECK, lately traveling aalesman for Haslet, Flanagan & Co. of Philadelphia, has connected himaelf with Reeves & Horner, manufacturers of and dealers in atovea and ranges in that city, and will push the sales of their goods in Eastern Pennsylvania, New Jersey and Delaware. The genial George is well known to the trade in those aections, and we have no doubt he will build up a valuable trade for his new firm.

AMONG the concerns recently organized for the manufacture of stoves may be mentioned the White River Stove Company of Clarendon, Ark., with a capital atock of $20,000.

THE BERLIN IRON BRIDGE COMPANY of East Berlin, Conn., are putting the roof on a building for the United States Government at Fort Wadsworth, N. Y. The building is 41 feet wide and 231 feet long, the roof being made entirely of iron—iron trusses covered with corrugated iron.

AN ELABORATE contribution by A. Borsig on the influence of additions of aluminum to pig iron is printed in *Stahl und Eisen*. His investigations confirm, on the whole, the reports of Keep and others.

THE NEXT meeting of the Western Foundrymen's Association will take place on Wednesday, January 24, at 7.30 p.m., in rooms 702-703 Temple Court Building, Chicago. A paper on "The Use of Coke in Foundries" will be read by C. K. Pittman of Chicago, and it is expected that several of the more prominent coke and foundry men of the West will be present and will take part in the discussion.

E. E. BARTO is making a trip among his New Jersey friends talking the Novelty line of heating and cooking goods for the Abram Cox Stove Company, Philadelphia.

SCHWAB & SERCOMB of Milwaukee, manufacturers of the Gilt Edge hot air furnace, constructed for burning coal, wood or natural gas, have made arrangements with J. A. Carey, for the past four or five years with the Boynton Furnace Company, to represent them in the sale of Gilt Edge furnaces in the States of Iowa, Northern Missouri and Western and Central Illinois. W. N. Shandrew continues with Schwab & Sercomb for the States of Wisconsin, Northern Illinois and Indiana and Western Michigan, so that they are fully equipped to look after the trade closely in the territory designated.

AN ARTISTIC PICTORIAL CIRCULAR issued by the Michigan Stove Company calls attention to the Garland aerated ovens, as used in the construction of their cooking stoves and rangea. The arrangement is illustrated, and the manner in which it operates is very thoroughly set forth.

THE EXCELSIOR STEEL FURNACE COMPANY, 110 to 114 South Jefferson street, Chicago, have leased for a term of years the five-story and basement building at 38 and 40 West Monroe street and will take possession of the second, fourth and fifth floors as soon as the same can be made ready for occupancy and will probably move on February 1. Parts of the building are occupied by other parties, and when their leases expire this company will take possession. The lease has a contract attached thereto by which four additional stories will be added in the rear in the event of their requiring more space. The new building will be fitted up for the manufacturing and storage of furnace fittings, furnaces, boilers and other goods in that line and will have a very complete plant. The location is a good one in every respect.

THE MILWAUKEE GAS STOVE COMPANY of Milwaukee, Wis., have issued a very fine catalogue of their specialties. It comprises 34 pages of unusually excellent engravings and neat letterpress, bound in flexible black leather with the company's address embossed in gilt letters on the side. Decorated paper lines the cover and forms the fly leaf. On looking over the pages it will be seen that the company's line of Perfection gas stoves has been considerably enlarged, denoting substantial growth and increasing popularity among consumers. The special points of the stoves are enumerated as follows: Self cleaning burners, telescopic oven burners, adjustable combination needle valves, oblong ironing burners, large ovens, water back in range, dirt pans, broiler on a level with baking oven, warming oven, mechanical construction, beauty of design and interchangeable parts. The combination needle valves make each burner adaptable at once to any kind of artificial or natural gas or gas at any pressure, insuring perfect and economical combustion. Ten styles of Perfection ranges are shown, from a huge six hole 600 pound range for heavy service to three-hole 200-pound constructions for small families. Then follow hot platea with one, two and three burners, single burner portable atoves in various styles, the No. 10 water heater with a capacity of 30 gallons in 45 minutes, the No. 20 water heater with a capacity of 200 gallons per hour, gas grates in two aizes, round gas heating stoves in three sizes with polished copper reflectors and three sizes with asbestos fronts, square reflector and asbestos heaters, the Perfection boiler iron heater, laundry flat iron heater with water circulation round the burner to prevent it from becoming overheated, the Perfection gas kiln for firing china and glass, the Dresden gas kiln for firing china and glass, the Perfection melting furnace for melting metals, tinners' soldering furnace with water jacket, jeweler's enameling furnace, gas coffee roastera, gas stove supplies and gas and gasoline ovens. Telegraph code words are furnished for convenience in ordering by wire when quick shipment is desired.

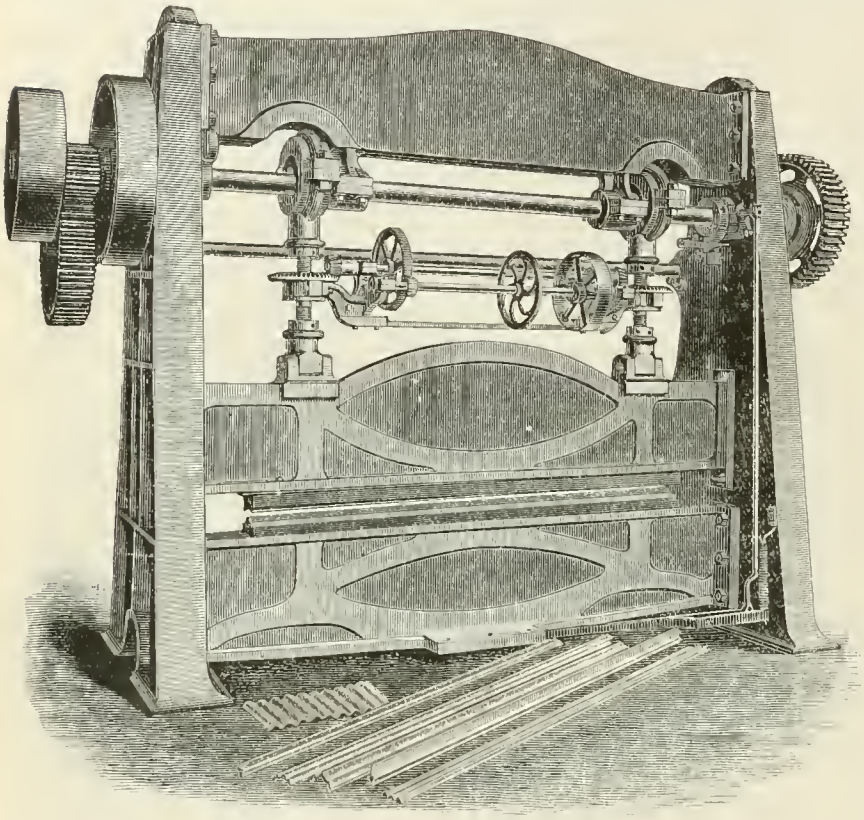
The Minnesota Stove Company, Shakopee, Minn., send out a card circular to the trade calling attention to their Premium Coral cook stove. Illustrations show the stove with and without reservoir, and both styles are made in four sizes, with ovens measuring from 20 x 22 to 22 x 24 inches. It is made with outside nickel shelf, cemented oven tops, patent door opener and nickel panels with tile center piece.

We have received, with the compliments of Henry Gleason, manufacturers' agent, 106 Beekman street, New York, a very tasteful and artistic calendar for 1894. It is in the form of a fan, composed of a bunch of maple leaves in all their gorgeous autumn tinting. The handle is gilt and adorned with a pink satin bow. To it is attached by white silk cords a miniature "art gem" calendar, each leaf of which bears an apt Shakespearean quotation. A card on the box containing the souvenir sets forth that Mr. Gleason is agent for the Trent Tile Company, the Matthews Mfg. Company and the New Jersey Lamp & Bronze Works. Inclosed in the box was a circular issued from the office of the Matthews Mfg. Company, Worcester, Mass., informing the trade that the company are making and selling stove knobs under certain U. S. patents which they own. The company announce that they find themselves in better condition to cater to their wants than ever before.

At the annual meeting of the Schuylkill Valley Stove Company, held at Spring City, Pa., on January 16, the following directors were elected: C. C. Armpriester, L. L. Esenhouer, Montgomery Frick, John W. Gephart, J. H. Richard and Andrew McMichael. At a meeting of the board C. C. Armpriester was chosen president; L. L. Esenhouer, vice-president; Montgomery Frick, treasurer, and John W. Gephart, secretary.

On Thursday of this week the Buck's Stove & Range Company resumed operations with a force of 350 hands. According to press dispatches from St. Louis, a notice was sent out on Monday, the 15th inst., ordering all the employees to report for work on Thursday, January 18. It stated that there would be no reduction in wages, and that the move was made for the purpose of giving midwinter employment to the deserving.

The Old Water Mill.—J. Wood & Bros. Company of Conshohocken, Pa., have published a highly interesting picture of their "Old Water Mill," which probably was the first to manufacture light sheet iron in America. Erected in 1831 by James Wood, it has continued in operation ever since—for 63 years—under direction of himself and direct descendants. While a considerable part of the old machinery yet remains, it was never equal to so much work as it is to-day. The tonnage of the old mill at the start and for some years afterward was only about 300 tons of No. 24 to No. 28 per annum. Now the production is from 2200 to 2400 tons. By reference to their old books J. Wood & Bros. Company find that during its early days the product of the mill sold at $160 to $170 per ton, when it is selling now at one-third of that figure, if not less. Although the old mill has not known what it was to stop night or day since 1831, it is pronounced as able now to hold its own against all competitors as it was when it practically had none to contend against.



Sheet Metal Press.—Fig. 1.—General View of Press.

Sheet Metal Press.

George A. Ohl & Co., Newark, N. J., are offering to the cornice and sheet metal trade a press, illustrated in Fig. 1. The machine, which weighs 20,000 pounds, has been designed especially to make use of dies, so as to make several bends at once, such as skylight bars, ceiling corners, eave troughs, corrugations, &c. Some of the dies and shapes formed by them are illustrated in Fig. 2. We understand that in this machine skylight bars, seven bends at a time of No. 24 iron, 8 feet long, have been made, while sheets of No. 14 iron have been corrugated in half a minute. The machine is so constructed that there is no springing of its different parts, thus securing, it is claimed, straight work and also great durability of the machine. It is arranged to be adjusted readily to the different shapes of dies and thicknesses of metal. The press is geared 1 to 20 and provided with an automatic clutch, enabling the operator to stop at any time.

Next Tuesday night an entertainment, consisting of reading, declamations, &c., will be given to the pupils of the day and evening classes in the lecture room of the New York Trade School, 1260 First avenue, New York.

A dispatch from Hartford, Conn., reports that throughout Central Connecticut there are evidences of a marked revival in the industrial situation—not a rapid movement, but a steady one. Hartford itself has suffered comparatively little from the late depression.

Of the 1500 men employed out of the relief fund on work in the park at Pittsburgh over one-half are native Americans.

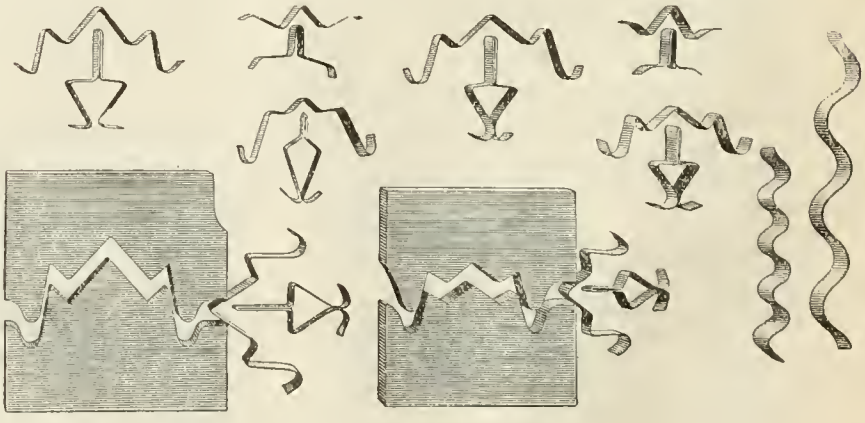


Fig. 2.—Examples of Work.

TRADE REPORT.

The Iron Market.

There are unmistakable signs, faint though they may be, of improvement in the Iron trade. There is more inquiry and more business is being done, though it must be confessed that in the majority of cases it is at the sacrifice of values. Still, every one understands that no hardening of prices can come until we begin to approach normal consumption.

We are far from that yet, but there is some encouragement in noting that the demand is growing. It may be true that this is delusive, because orders deferred in December are now being given out. We are inclined to believe that many consumers have reached the point when they must replenish stocks. As is natural, this crops up first among those staples which are distributed in the smallest quantities to the largest number of buyers. Thus the whole range of the Wire trade is reported as experiencing a very large demand for this season of the year.

We believe that the trade is concentrating its attention altogether too much upon the terrible condition of prices and is not watching closely enough the volume of the demand.

Some pretty good contracts for Cast Iron Pipe have been given out in the last four weeks in different parts of the country. The Standard Gas Light Company bought upward of 5000 tons. Brockton and Boston are in the market for like quantities, and several Northwestern cities have p'aced moderate orders. Prices, however, have been very low.

An order for 3½ miles of 8-inch Wrought Pipe has produced a record breaking price in Pittsburgh.

Pig Iron.—The New York market is quiet, although a somewhat better inquiry is noted. As yet the leading makers of Eastern Pennsylvania brands have not met the price made by the Lowmoor Company, although good Virginia Irons have sold for a considerable time below the prices named. It is understood the Lowmoor Company have not placed much Iron for immediate delivery, but that they have placed quite considerable contracts for the near future. We quote standard brands, $13 @ $14 for No. 1; $12.50 @ $13 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $13.50 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12 for No. 3; $11 50 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

Philadelphia advices intimate that the Pig Iron market in that district maintains its condition of dullness. There is more Iron offering, and although prices are nominally unchanged, it only needs the right kind of a bid to secure more or less of a reduction. Large consumers are not in the market to any extent, and for the time being buyers and sellers alike are touching the market carefully. Conditions are on the whole less favorable to the seller than has yet been the case, although there is a chance that the current demand may enable holders to maintain their position. General asking quotations for seaboard deliveries are about as follows:

No. 1 Foundry	$13.75 @ $14.25
No. 2 Foundry	13.00 @ 13.25

In Chicago very little business has transpired in Southern Iron and prices appear to be somewhat weaker, current quotations having been shaded on some sales of small lots. Business in local Coke has not improved in accordance with the increased inquiry reported last week. Outside of a 1000-ton sale transactions have been confined to small lots. Travelers through the Northwest report prospects unfavorable to much business in the near future from that section. This does not arise from lack of confidence among foundrymen, or the hope that prices will be lower, but really on account of the limited amount of work which is now obtainable. There is some expectation, however, that business will improve in that section as spring approaches. Lake Superior Charcoal is still neglected. Quotations are now as follows for cash:

Lake Superior Charcoal	$15.30 @ $15.50
Local Coke Foundry, No. 1	13.00 @ 13.50
Local Coke Foundry, No. 2	12.50 @ 12.75
Local Coke Foundry, No. 3	12.00 @ 12.50
Local Scotch	13.50 @ 14.00
Ohio Strong Softeners No. 1	15.50 @ 16.00
Southern Silvery, No. 1	..... @ 13.75
Southern Silvery, No. 2	..... @ 13.25
Southern Coke, No. 2	11.90 @ 12.15
Southern Coke, No. 3	11.40 @ 11.65
Southern, No. 1, Soft	11.90 @ 12.15
Southern, No. 2, Soft	11.40 @ 11.65
Tennessee Charcoal, No. 1	16.00 @ 16.50
Tennessee Charcoal, No. 2	..... @ 15.00
Alabama Car Wheel	18.00 @ 18.50
Jackson County Silvery	16.00 @ 16.50
Other Ohio Silvery	15.00 @ 15.50

While no actual increase in the demand for Pig Iron has been noted in the Pittsburgh market, there are symptoms there which lead to the belief that the situation will not get any worse, but may soon show improvement. Buyers have not as yet shown any inclination to purchase very far ahead. However, we are advised that in a few cases where buyers have contracts running for two or three months ahead they have notified the seller that they will be able to take the Iron out a little ahead of time. This is indicative of an increased consumption in certain sections, which may become general before long. Quotations are given as follows:

No. 1 Foundry	$11.75 @ $12.00
No. 2 Foundry	11.25 @ 11.50

While there has been some little increase in the demand for Pig Iron during the past week in Southern markets, it was not large enough to be significant. There was some buying by the Iron Pipe Works in the South, but not to any large extent, the largest sale being 2000 tons for delivery running through four months, and the jobbing foundries appear to be doing a little more business. The tone of the market is decidedly weak, and if there was any disposition to buy largely it is apparent that a concession of at least 25¢ ₱ ton could be secured on most if not all grades of Foundry Iron. There have been some small sales of Charcoal Iron, but nothing has transpired to indicate any essential change in the market. Quotations are as follows:

Southern Coke, No. 1	$11.75 @ $12.00
Southern Coke, No. 2	10.75 @ 11.00
Southern Coke, No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—Slow trade and lower prices stand as the prominent features of the market for the week under review. There has been hardly any speculative movement here and very little tendency in that direction. Trade and consumptive demand have continued to be comparatively light, and for the most part at a slightly lower level of prices. The dullness of trade here, along with the further depreciation in London values, has caused prices to droop still further, leaving a net loss for the week of about 0.10¢. Ten-ton lots have been sold at 20.10¢ @ 20 15¢, to a moderate extent, and jobbing parcels at corresponding prices. At this writing bids above 20¢ net cash for round lots are few and far between. Jobbers' prices for small lots are quoted at 21½¢ @ 22¢. Straits shipments during the first half of January were 675 tons Great Britain and America and 250 tons to the Continent, against a total of 1750 tons in the corresponding period last year.

Copper.—Warnings of something in the nature of a real break in prices were sounded on the Metal Exchange on

Tuesday, when Lake Superior Ingot was offered at 10¢ for delivery from February to May, inclusive, and at 9¾¢ for June and July delivery. Representatives of the leading producers intimated that those prices were purely speculative and no reflex of true market value. but, whatever the facts in this connection, it was demonstrated beyond all question of doubt that sales of Lake Ingot have been made at 10¢ regular terms to the amount, it is said, of at least 250,000 pounds. Electrolytic Copper is quoted at 9¾¢, common Casting stock at 9¼¢ @ 9½¢, according to brand and quantity. The consumptive demand is said by dealers to be very languid, yet prices for small lots remain—at least nominally—at the former level, namely, 11¢ ℔ lb for Lake Ingot.

Sheet Copper.—No improvement has as yet developed in the market for Sheet Copper, although hopes are entertained of a revival of demand when some of the building operations now under consideration are actually started, which may not be until early summer. Stocks in jobbers' and consumers' hands everywhere are believed to be very attenuated, so that a good business is anticipated when these conditions are fulfilled.

Pig Lead.—Prices have remained almost stationary and business has been exceedingly slow. It is asserted that 2500 tons or more are in store here or held by local merchants; that the principal consumers are carrying more surplus stock than usual, and that a considerable accumulation has taken place at Western points during the past month or six weeks. In short, the statistical position would appear to be unfavorable and the market suffered from the fact that considerable quantities of Lead remain in the hands of operators, who bought more or less freely at from 3¾¢ down to 3½¢ on the theory that Lead was very cheap at those prices. Unfortunately, theory and fact failed to harmonize, and at 3.20¢, the current quotation, probably the entire holdings could be duplicated. Prices for small lots from store are still down to 3¾¢ @ 4¢, with ample stocks on hand.

Lead Pipe and Sheets.—Business in these products continues very tame, with no immediate prospect of any material improvement. Local manufacturers have reduced their list price for Lead Pipe and Sheet Lead ½¢ ℔ lb, as detailed in another column.

Spelter.—The position of the market is practically the same as it was at the date of last market report. On the theory that prices are phenomenally low, most holders seem inclined to stand out for better prices, but the weight of facts causes others to make the most of a poor position, and the result is that not only common Western but brands that run somewhat above the average in quality have been sold at 3.55¢ in single carload lots for prompt and near future shipment. Business in inferior brands has been effected at as low as 3.50¢, prompt shipment from the West, while 4¼¢ is asked for smaller jobbing quantities, for which there is no more than a fair demand.

Antimony.—Dealings have been of a perfunctory character and moderate all told. Prices for small lots remain quite steady at 10¼¢ @ 10½¢ for Hallett's and 10¾¢ @ 11¢ for Cookson's,

Tin Plate.—The probable recovery in the demand for Tin Plates which was looked for after the second week of the new year has failed to materialize during the past week, although some fairly good business was effected in the early part of the week in Coke Plates of special sizes for near future delivery. The prices obtained were, however, invariably low, being, on the average, about 5¢ @ 7½¢ below those current for spot goods. In general, the business that is passing continues confined to the narrow proportions which have characterized the trade for so many months—namely, nothing beyond the satisfying of absolute wants. The demand is much behind the average for this season of the year, nor is it at all likely to expand until something definite is known as to the fate of the Wilson Tariff bill as it affects tin plates. When this is settled the conditions will be favorable for a very good if not a rushing demand, to meet which may tax the resources of importers and manufacturers, stocks being now remarkably light both at the seaboard and in the interior. The line in which the most constant business seems to be maintained is in domestic Terne Plates, for which a very fair current demand exists, although stocks of these plates at the works and in jobbers' hands are at present amply sufficient to meet all the calls upon them. Prices on spot goods are somewhat irregular, with the tendency in buyers' favor.

A cable dispatch of January 17 from London to *The Iron Age* reports the British Tin Plate market as weak, with easier prices and reduced inquiry. Liverpool prices are quoted as follows:

IC Charcoal, Alloway grade.....12/3 @ 12/9
IC Bessemer Steel, Coke finish. .. 11/ @ ....
IC Siemens " " " .....11/3 @ ....
IC Coke, B. V. grade, 14 x 20.....11/ @ ....
Charcoal Terne, Dean grade.....10/6 @ ....

We are in receipt of a letter from the Cowles Electric Smelting & Aluminum Company, Lockport, N. Y., denying the report that has recently been printed that they had consolidated with the Pittsburgh Reduction Company. They say that the two companies are not consolidated, nor are there any negotiations to that effect pending, neither are they expecting to move their plant to Niagara Falls. Their works at Lockport are still in operation and they are prepared to furnish aluminum and their different alloys as heretofore.

Fire damaged the Turner Bros'. Works, 109-111 North Water street, Chicago, to the reputed extent of $6,000, on January 15.

Chicago Report.

Scrap.—Iron and Steel are lower than ever, on account of the increasing supply and the light consumption. Dealers furnish the following revised list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.50	...
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	7.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3⅛¢
Pipe Lead	....	2⅛¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—Dealers report no improvement. The weather has been springlike for the past fortnight. Concessions from regular rates fail to stimulate the demand. Carload lots of 12 net tons or over are still nominally quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

An unusually serviceable trade souvenir is issued with the compliments of the Star Baker Company of Belleville, Ohio, in the interests of the Columbia Roaster and Baker, which they manufacture. The advertisement in the souvenir is confined entirely to the modest announcement on the cover. The book, measuring 5½ x 2 inches in size, is "Thompson's Pocket Speller," and contains over 100 pages of double columns, giving all the ordinary words that would be employed in correspondence. Reference to the words is made very easy by means of a ledger index along the side of the pages. In addition to the regular dictionary there is given at the end a list of words pronounced alike or nearly so, but spelled differently. This is followed by a list of names of men and women, rules for the use of capitals and punctuation, abbreviations, &c. A valuable feature is the list of forms for notes, bills and receipts. On the inside of the back cover is an erasable page for memoranda.

CONDITION OF THE

Hardware Trade.

THERE IS a perceptible increase in the volume of business, orders beginning to come in from the travelers who are in the field. There are many, however, who have not yet started out and many more from whom there has not yet been time to hear. Manufacturers and the large trade report many inquiries in regard to quotations and terms on considerable parcels of goods, indicating that the trade throughout the country are making careful preparations for the season's business. There is little to report in the way of prices, quotations being, as a rule, on substantially the same level as for some time past. There seems to be, however, a somewhat better feeling in some staple goods, and some well informed parties express the hope that the bottom has been touched and that the reaction must soon come, or at least that present prices will be maintained. On the other hand, the tone of the market in general Shelf Hardware is not especially strong. Some irregularities have been developed in lines on which prices have hitherto been pretty steadily maintained. An important feature of the situation also is the fact that there is a disposition among manufacturers to reduce wages, and in many lines reductions ranging from 10 to 33⅓ per cent. have been made. This influence, with the low prices ruling on raw material will naturally have the effect of reducing ultimately the price of the manufactured articles. The trade, recognizing this fact, are naturally indisposed to purchase beyond their early requirements, but with the better feeling prevailing in business circles are making their preparations for a fair season's trade. The fact that both manufacturers and merchants have unusually light stocks is an important factor in the situation, and many well informed Hardwaremen think that if business attains even a fair volume, the prices of some lines of goods may be strengthened on this account.

Advices from Chicago.—Jobbers note, as a peculiar feature of this season's trade, that while business for immediate shipment is smaller than usual their orders for future delivery are unusually large. A big movement is promised in Refrigerators, Wire Cloth, Poultry Netting, Screen Doors and Windows, Ice Cream Freezers, steel goods, &c. Shelf goods are nevertheless gaining in volume of business and the outlook grows more encouraging. It is generally believed that if the tariff question was to be settled decisively trade would become very active, as all stocks are light from manufacturers to dealers and consumers. Business in heavy Hardware is not so good as it has been and considerable complaint is heard of the falling off of business among the smaller manufacturers who are the customers of jobbers.

Notes on Prices.

Wire Nails.—While the demand for Wire Nails has not set in in heavy volume there are decided indications of an improvement, and it is evident that the trade are disposed to supply their wants in the near future. A good many small orders are being received and the manufacturers have many inquiries from the jobbing trade and also from retail houses, which lead them to expect a fair volume of business before long. Prices are steadily maintained at former figures, the market being represented by the quotation of $1.10 for carload lots at mill, with a concession of 5 cents on large orders. The mills are increasing their production and getting in shape for the anticipated trade, the year having opened with exceptionally small stocks on hand.

Advices from Chicago.—The opinion gains ground that Wire Nails have turned the corner and that the lowest price for the present has been made. There is a constantly improving demand and sales are running along quite satisfactorily. The factory price appears to be gradually settling at $1.20, Chicago, on the usual terms. Jobbers are selling at $1 25 to $1.30 from stock and report a very active inquiry from dealers for carload lots. This is reducing jobbers' stocks rapidly and is expected to help their prices.

Cut Nails.—The Cut Nail market, without having developed any special activity, seems to be in a somewhat better condition, and prices are slightly firmer. They are still represented by the quotation of 90 cents in carload lots at mill, but some of the manufacturers refuse to make this figure. Small lots from store in New York are held at $1.20 to $1.25.

Advices from Chicago.—Trade in Cut Nails is growing heavier. Orders are not only larger, but specifications are coming in more freely than for several weeks past. The increased trade from districts hitherto occupied exclusively by Wire Nails continues to be a source of encouragement to the Cut Nail manufacturers. They are advised by jobbers that the demand for mixed carloads of Wire and Cut Nails is again a feature of the trade. Quotations on factory lots continue to be $1.15 to $1.20, Chicago, with concessions for high averages. Jobbers are quoting $1.25 from stock.

Barb Wire.—The Barb Wire market is characterized by the same general features as for the past few weeks, there being no important change in price and no marked increase in the demand. Some of the manufacturers, however, while referring to the unprofitably low figures which are prevailing, express the conviction that the volume of trade during the next few months will be exceptionally heavy, there being indications of a large demand from several sections of the country. There is a good deal of unevenness in the prices made by the different manufacturers, some of whom are selling Galvanized Four Point at $2.05 at mill, with 5 cents off in carload lots. Other manufacturers are refusing to meet this figure and are obtaining a considerably higher price.

Advices from Chicago.—Considerably more business is doing in Barb Wire. Contracts are now being made for the replenishment of jobbers' stocks, as they find a better demand from retailers throughout the West and Northwest. The market, however, is a little lower in consequence of the efforts of manufacturers further East to secure business in this territory. Carload lots are therefore quotable at $2.20 to $2.25 for Galvanized, while small lots from stock are selling at $2.30 to $2.40.

Poultry Netting.—The market in Poultry Netting is characterized by animated competition among the manufacturers, and as a result exceptionally low prices have been developed.

Hinge Cover Square Can.—The Record Hinge Cover Square Boxed Can, manufactured by Record Mfg. Company, Conneaut, Ohio, and illustrated in our issue of December 30, 1893, is sold at the following list, subject to a discount of 50 per cent. :

	Each.
1 gallon can	$0.50
5 " "	1.00

Hat and Coat Rack.—The Derby Hat and Coat Rack, for which the American News Company, 37 to 41 Chambers street, New York, are agents, are sold at $2 per dozen, 30 days net, alike for all sizes.

Glass.—The question as to whether all Glass factories will shut down February 10 is an interesting one to all engaged in the Glass trade. At a meeting of manufacturers held last week in Pittsburgh this action was unanimously adopted, although but a limited number of manufacturers were present at the meeting. The action of the meeting, it is stated, is not to be binding upon the individual manufacturer unless 85 or 90 per cent. of the pots available for operation can be induced to unite in the movement; and this is considered doubtful. Stocks of Glass in manufacturers' hands are small, and those whose factories are running have no trouble in supplying the demand. Pittsburgh reports quote 85 and 10 and 5 per cent. discount for single, and 85 and 20 per cent. discount for double strength, as the lowest prices being made from factory. A New Jersey manufacturer refused an offer of 85 and 7½ per cent. discount for a carload of single strength Glass, but accepted the order at 85 and 5 per cent. discount. It is reported that a Western firm recently quoted Glass at 85 and 20 per cent. discount, f.o.b. Baltimore. The foregoing represents the variation in prices in different parts of the country. In Plate Glass circles it is understood that

a quiet understanding is in operation among three or four of the larger Pittsburgh firms, which has had the effect of checking the downward tendency of prices to some extent.

Lead Pipe and Sheet Lead.—Colwell Lead Company, 63 Centre street, New York, issued on January 18 a new price-list of Manufactured Lead, subject to market changes without notice, on the following basis:

Lead Pipe	5¾¢ ℔ lb
Sheet Lead	6½¢ ℔ lb
Block Tin Pipe	37½¢ ℔ lb
Tin Lined Pipe	15 ¢ ℔ lb

The usual charges will be made for packing and cartage. Packages returned in good order, freight paid, credited at cost. Old Lead in exchange 2¾¢ ℔ lb

Old Metals.—The demand for Old Metals is of the same languid, uncertain character previously mentioned. Prices are fairly steady, although still very low. Some fair sales of small lots of Scrap Iron have been noted, but nothing is done on a large scale, nor is there any present sign of an increased demand in the near future. The following quotations represent generally the prices paid by New York dealers for moderate quantities of Old Metals:

Heavy Copper	℔ lb 7¢
Light and Tinned Copper	℔ lb 6½¢
Heavy Brass	℔ lb 5¢
Light Brass	℔ lb 4½¢
Lead	℔ lb 3¢
Tea Lead	℔ lb 2¾¢
Zinc	℔ lb 2½¢
No. 1 Pewter	℔ lb 14¢
No. 2 Pewter	℔ lb 6¢
Wrought Scrap Iron, ℔ gross ton	$7.00 @ $8.00
Heavy Cast Scrap, ℔ gross ton	8.00 @ 9.00
Stove Plate Scrap, ℔ gross ton	4.00 @ 5.00
Burnt Iron, ℔ gross ton	2.50 @ 3.00

Old Paper, Rags, &c.—No improvement has yet developed in this market, and the tendency of prices is to decline. Quotations for New York delivery are about as follows:

No. 1 White Rags	℔ lb 3¼ @ 3½¢
No. 2 White Rags	℔ lb 2¼ @ 2⅝¢
Mixed Rags	℔ lb ¾¢
Blues and 3ds	℔ lb 1 @ 1¼¢
Hard Sized White Shavings	℔ lb 2¼ @ 2⅝¢
No. 1 White Book Shavings	℔ lb 2 @ 2⅛¢
No. 2 White Book Shavings	℔ lb 1 @ 1⅜¢
Light Book Shavings	℔ lb ¾¢
No. 1 Mixed Shavings	℔ lb ¾ @ 1 ¢
No. 2 Mixed Shavings	℔ lb ½ @ ¾¢
No. 1 Printed Books	℔ lb 1 @ 1¼¢
Ordinary Mixed Books	℔ lb ½ @ ¾¢
Newspapers	℔ lb 2-5 @ ½¢
No. 1 Manila Paper	℔ lb 1 @ 1⅛¢
No. 2 Manila Paper	℔ lb ⅝ @ ¾¢
Bogus Paper	℔ lb ½¢
Common Paper	℔ lb ⅜¢
Straw Chips	℔ lb ½¢
Binders' Clippings	℔ lb ½ @ ⅝¢
Jute Butts	℔ lb 1⅞ @ 2 ¢
No. 1 Jute Bagging	℔ lb 1 @ 1¼¢
Mixed Bagging	℔ lb ¾ @ 1 ¢
No. 2 Bagging	℔ lb ½ @ ¾¢
Hemp Twine	℔ lb 2 @ 2¼¢
Manila Rope	℔ lb 2¼ @ 2⅝¢
Jute Rope	℔ lb 1½ @ 1¾¢
Mixed Rope	℔ lb ¾ @ ⅞¢

Old Rubber.—Market narrow and prices irregular. The following quotations are those nominally ruling for Old Rubber delivered in this city:

Car Springs, ton lots, ℔ lb	@ $0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb	@ .03
Rubber shoes, less than carloads, ℔ lb	0.02¼ @ .03⅛
Large Hose, ℔ ton	@ 9.00
White Wringer Rolls, ℔ lb	@ .04¼
White Syringes, ℔ lb	@ .05

Trade Notes.

At Valparaiso, Ind., on the 11th inst. the sale of the Vienna Enamel & Stamping Works to A. J. Johnson of Chicago was confirmed by the court. Mr. Johnson bid in the plant for Gustav Wilkes of Chicago, who expects to start up about March 1. The property cost over $100,000.

A company to manufacture gas and electric light fittings in New York City has been incorporated with the Secretary of State at Albany under the name of the Black & Boyd Mfg. Company The directors of the concern are John A. Black, W. P. Brice. L. Plaut and Herman Plaut of New York City. Capital, $25,000.

The Simpson-Fry Mfg. Company were incorporated on January 16 to manufacture metallic goods in Brooklyn, N. Y., with a capital of $12,000. The directors are J. C. Fry, J. C. Fry, Jr., and J. S. Simpson of Brooklyn.

The Cleveland Steel Company, Cleveland, Ohio, have purchased the entire plant of the Britton Iron & Steel Company, Cleveland, who were manufacturers of bright and galvanized sheet iron and steel. The Britton plant has been closed entirely for the purpose of remodeling and the latest improved methods for the manufacture of Sheet Steel in all its branches will be introduced. The Cleveland Steel Company are also erecting a steel melting department in connection with the works for the manufacture of the highest grades of steel.

The Scottdale Iron Steel Company, Limited, Scottdale, Pa., manufacturers of iron and steel sheets, are adding two new sheet mills to their equipment and buildings to cover same. The addition of these two new mills requires the erection of two additional sheet heating, two bar heating and one annealing furnace, which are now under construction. This firm are also putting in one of Warren Webster & Co.'s feed water heaters and purifiers of 1500 horse power. The excavating has been completed and the materials are now on the ground for the foundations. New foundations are also being put in under the large sheet mill engine and fly pit wheels, and a new wrought iron shaft is being added to one of the fly wheels, to replace an old one. Other necessary repairs are also being made.

Investigation proves that there are good grounds for the report that sheet mills will be built at Canton, Ohio. The active people in the enterprise are a number of former employees of Kirkpatrick & Co., Leechburg, Pa., who were recently locked out. An organization has been formed and arrangements made with the Canton Board of Trade to locate at that point. E. L. Burchfield is secretary of the new company. It is expected that contracts will be placed about the 20th of this month. The fact that the iron and steel roofing concerns consume annually about 7000 tons of black and galvanized light sheets was an important factor in deciding the location. The new plant will consist of two sheet mills and a sheet bar mill and will cost when completed about $50,000.

The sheet mill plant of the Ellwood Steel Company, Ellwood, Pa., was sold last week at assignee's sale for $33,500, the purchase being made by A. W. Brown, vice-president and general manager Cambridge Iron & Steel Company, Cambridge, Ohio, acting in the interests of the stockholders. These works consist of four sheet mills without sheet bar mill. The buildings are made of steel and every part of the machinery is new. Wm. Tod & Co., Youngstown, Ohio, furnished the engine, which is geared to run two trains of rolls, one from each side. The roll trains were furnished by the Leechburg Foundry & Machine Company, Leechburg, Pa. The plant is equipped throughout with every modern convenience, annealing furnaces of recent design and all necessary facilities. It is stated that operations will commence in a few weeks.

The W. F. Washburn Brass & Iron Works, Yonkers, N. Y., which closed down last month when the firm made an assignment, will, it is announced, start up again in a few days to fill orders in hand. The works employ about 250 men.

A press dispatch from Easton, Pa., reports that the American Sheet Mill, at Phillipsburg, N. J., employing 100 hands, will resume operations on February 1.

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Metal and Miscellaneous Prices.

CHICAGO, JANUARY 18, 1894.

Tin—

Straits pigs.....23¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @ $5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @ 11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20.	5.75 @ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—

IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20.....$7.00
" " IX, 14 x 20..... 9.00
" " IXX, 14 x 20.....11.00
" " IC, 20 x 28.....14.00
" " IX, 20 x 28.....18.00
" " IXX, 20 x 28.....22.00

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal, extra, IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch, IC, 20 x 28.....@$11.50
Crescent, IC, 20 x 28.....@ 12.25
Crescent, IX, 20 x 28.....@ 15.25
Empire, IC, 20 x 28.....@12.50
Empire, IX, 20 x 28.....@15.50
Hickory, IC, 20 x 28.....@ 12.75
" IX, 20 x 28.....@ 15.75
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 15.00
" IX, 20 x 28.....@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28.....@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28.....@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28.....@$10.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28.....$23.60
Irondale A:
IC, 14 x 20..... $6.25
IX, 14 x 20. ..... 7.75
IC, 20 x 28..... 12.50
IX, 20 x 28..... 15.50
Westmoreland:
IC, 14 x 20..... $6.25
IC, 20 x 28..... 12.50
Elwood:
IC, 20 x 28.....$12.00
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50
Illinois, Old Method:
IC, 20 x 28.....$17.00
E. L.:
IC, 20 x 28.....$12.50
Jessie:
IC, 20 x 28.....$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20.....$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 .....11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28.....19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28.....22.00
Neville, Stamped, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28.....12.50
" " IX, 20 x 28.....15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared).....$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared).....19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared).....
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared).....16.50
Columbia, IC, 14 x 20 (Stamped).... 7.25
" IC, 20 x 28 (Stamped)....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28.....13.00
Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28.....12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 ..... 12.00
Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28..... 12.00
" IX, 20 x 28.....15.00
" (Redipped), IC, 20 x 28.....17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.00

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ ℔ 2 6-10¢	3 2-10¢
17 to 20	℔ ℔ 2 7-10¢	3 3-10¢
21 to 24	℔ ℔ 2 8-10¢	3 4-10¢
25 and 26	℔ ℔ 2 9-10¢	3 5-10¢
27	℔ ℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ ℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality..dis. 70&7½@10%

Copper—

Ingot.

Lake.....12¢ @ 12½¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 30%.

Copper Bottoms.

Discount, 30%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...35¢
Plain, above 3 inch.....45¢
Plain, 5-16 inch.....45¢
Plain, ¼ inch.....60¢
Plain, 3-16 inch.....$1.00
Plain, ⅛ inch.....$1.50
Fancy Tubing, Brass, to No. 20 incl.....43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass.....

40 & 45 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....4¾¢
300 ℔ casks.....5 ¢
Loose sheets.....5¼¢

Lead—

Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12½¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain.....57½&10%
1¼ and under, Galv.....50½&10%
1½ and over, Plain.....67½&10%
1½ and over, Galv.....57½&10%
Boiler Tubes, list Oct. 24, 1892...65@67½%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.75 sqnare
Climax.....$3.50 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.35 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints Oils, &c.—

Deodorized Benzine.....7¾@8 ¢
Iron Paint, Bright Red.....℔ ℔, 2 ¢
" " Brown.....℔ ℔, 1¼¢
" " Purple.....℔ ℔, 2¼¢
" Ground in oil, B. Red ℔ ℔, 6¼¢
" Ground in oil, Red. ℔ ℔, 6¼¢
" Ground in oil, Brown ℔ ℔, 5¼¢
" Ground in oil, Purple ℔ ℔, 6 ¢
Linseed Oil, Boiled, in oils.....50¢
Linseed Oil, Raw, in bbls.....47¢
Mineral Paints.....2@4¢
Orange Mineral.....9¾¢
Pure White Lead in Oil.....6@6½¢
Dry White Lead in bbls.....5½@5¾¢
Red Lead, American.....6@6½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ℔ gal..... 34¢
Spirits Turpentine, in bbls., ℔ gal...35½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, JANUARY 19, 1894

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal (guaranteed over 94% pure Aluminum), in ton lots..... ℔ ℔, $0.70

No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ ℔ .75

Lots less than 1 ton, 10¢ ℔ ℔ additional.

Antimony—

Cookson.....℔ ℔, 10¾¢@11¢
Hallett's.....℔ ℔, 10¼¢@10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—

List May 20, 1889.

	Prr ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu...	43

35@40%

Copper and Bronze Tubing—

8¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ ℔
Over 3½ to 5 inches inclusive.....18¢ ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ ℔
Over 3½ to 5 inches inclusive.... 19¢ ℔ ℔

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢

Planished.....net

Sheet and Bolt.....25&25&5%

Tubes — See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp,

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2.70	3 ¢
Nos. 17 to 20	℔ ℔, 2.80	3.10¢
Nos. 21 to 24	℔ ℔, 2.90	3.20¢
Nos. 25 and 26	℔ ℔, 3	3.30¢
No. 27	℔ ℔, 3.10	3.40¢
No. 28	℔ ℔, 3.15	3.50¢
American B. B.	℔ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11¾@12½¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ ℔, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70&5&10%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—

Lee's.....33⅓%

Lead—

American Pig.....3¾¢@4¢
Bar.....4½¢
Pipe.....5¾¢, 20%
Tin Lined Pipe.....16¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6½¢, 20%

Old Lead in exchange, 2¾¢ ℔ ℔.

Metal Exoanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ⅛ bbls.	6½ @ 7
Lead, Red, kegs	6¼ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1¼ @ 2¼

Linseed Oil:
Raw, ℔ gal..... @ .40
Boiled..... @ .43
Spirits Turpentine:
In bbls..... @ .32
Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans..... .01¾ @ .02½
In bladders..... .01¾ @ .02¼
Roofing Material, &c.:
Asphaltum, Trinidad Refined, ℔ ton..... $30.00@$35.00
Asphaltum, Rock, ℔ ton..... $14.00
Coal Tar Felt, 1 Ply, ℔ ℔..... 2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft. $1.85
Roofing Pitch, ℔ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 Inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	℔ ℔	℔ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained, Rosin, C. & D..... ℔ bbl. $1.22@$1.23
Rosin, E. & F..... ℔ bbl. $1.35@$1.50
Rosin, G. & H..... ℔ bbl. $1.60@$1.80
Rosin, I. & K..... ℔ bbl. $1 80@$2.20
Rosin, M. & N..... ℔ bbl $3.50@$3.70

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ℔ sqr..... $3.25@$4.50
Pen Argyle, ℔ sqr..... 3.50@ 4.25
Peach Bottom, ℔ sqr..... 5.00@ 6.25
No. 1 Chapman, ℔ sqr..... 4.00@ 4.65
Lehigh Slates, ℔ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ℔ sqr..... 2.70@ 3.20
Purple, ℔ sqr..... 3.50@ 4.50
Unfading Green, ℔ sqr..... 3.50@ 4.00
Red, ℔ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13½@14¢
No. 1..... 11¾@12¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ℔ ℔..... 4¢
Smaller quantities, ℔ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ℔ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
5 bbls., about 500 ℔, ℔ ℔..... 3½¢
½ bbls., about 300 ℔, ℔ ℔..... 4¢
Kegs, about 110 ℔, ℔ ℔..... 4¢
75¢ extra for keg.
5% dis.
Kegs, about 55 ℔, ℔ ℔..... 4¢

Yager's Soldering Salts.
¼-℔ bottles, each..... 80¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢
Bertha..... 8½¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ℔ ℔..... 22¢@22½¢
Straits, pigs, ℔ ℔..... 21½¢@22¢
Straits in bars, ℔ ℔..... 22½¢@23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.... $7.00
Alderly, extra quality, IC, 14 x 20..6.87½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 6.00
" " IX, 14 x 20..... 7.00
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.87½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 .....12.00
" IX, 20 x 28..... 15.00
Empire, IC, 14 x 20 ....6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28 ..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20 ..... 8.00
Knoxall, IC, 14 x 20 ..... 0.00
Laufman's Apollo (Resquared), IC, 14 x 20 ..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20 ..... 9.37
Leomiuster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20 ..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20 ..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... .....12.00
" IX, 20 x 28..... ....15.00
Neville, IC, 14 x 20 .... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 0.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... .....10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20 ..... 5.80
Waldo Redipped, IC, 14 x 20..... 6.25
Westmoreland, IC, 14 x 20 ..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merion, IC, 14x20.. ..... 6.75
Mint, IC, 14x20.... ..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... .... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....$5.40
20 x 28.....10.80
IX, 14 x 20..... 6.62½
20 x 28.....13.25
Abercarne Grade.—IC, 14 x 20..... 5.80
20 x 28.....10.60
IX, 14 x 20..... 6.50
20 x 28.....13.00

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ℔ ℔.
Melyn and Cardiland Grade. IC, 10 x 14.....$6.50
" " IC, 12 x 12..... 6.75
" " IC, 14 x 20..... 6.5
" " IC, 20 x 28..... 13 (illegible)
" " IX, 10 x 14..... 8 25
" " IX, 12 x 12..... 8 50
" " IX, 14 x 20..... 8
" " IX, 20 x 28.....16 50
" " DC, 12½ x 17..... 9.
" " DX, 12½ x 17..... 8 .
Allaway Grade. IC, 10 x 14..... 5.87½
" " IC, 12 x 12..... 6 12½
" " IC, 14 x 20..... 6.
" " IC, 20 x 28.....11 75
" " IX, 10 x 14..... 7 25
" " IX, 12 x 12..... 7 50
" " IX, 14 x 20..... 7 25
" " IX, 20 x 28.....14 50
" DC, 12½ x 17..... 5.50
" " DX, 12½ x 17..... 6.75
Coke
Steel Coke.—IC, 10x14, 14x20.....$8 40
10x20..... 8 25
20x28.....11 50
IX, 10x14, 14x20..... 6.75
B. V. Grade.—IC, 10x14, 14x20..... 5.50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets).....$18.38
IXX, 14x28..(112 sheets)..... ..... 14.50
IXX, 14x31..(112 sheets)..... ..... 16 00

Tinning—Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... .... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ℔ doz..... 18.00

Zinc—

600 ℔ casks..... ℔ ℔ 5¢
Per ℔..... .....5¾¢@6¢

It Is Reported—

That the Hardware store of A. J. Stewart & Co., Sullivan, Ind., was burglarized on the 4th inst.

That T. T. Smith has sold out his Hardware store at Nebo, Ill., to Alves Hayes.

That Charles Meddaugh has recently entered the Hardware business at Garner, Iowa.

That H. B. Sultelgte has purchased the Hardware stock of H. H. Parrish, Archer, Iowa.

That the style of the Implement firm of R. W. Coates & Co., Bloomington, Ill., will on March 1 be changed to M. A. Coates & Co. The firm have been in business about 15 years. R. W. Coates will retire in order to give his whole attention to other affairs.

That the Hardware firm of Evans & Kelly, Savannah, N. Y., has been dissolved by mutual consent. R. H. Kelly retiring. The business will be continued by A. W. Evans. Mr. Kelly will remove to Walcott and engage in the Hardware business with his father at that point.

That Tulley & Davis, Lowville, N. Y., have dissolved partnership. Edgar A. Davis will continue the Hardware business and James H. Tulley the tinshop.

That J. W. Goodhue's Hardware store at Ipswich, Mass., was burned out in a large fire at that place on the 13th inst.

That S. A. Peck has sold his stove and tin store at Greenfield, Mass., to Williams & Knight.

That on the 12th inst. the Hardware establishment of C. Dreisbach's Sons, Lewisburg, Pa., was damaged by fire the extent of $3500.

That Joseph L. Eicher has sold out his stock of Hardware at Quincy, Ohio, and will enter some other business.

That the Hardware store of Edwards & Grant, Melrose, Ohio, was robbed on the 4th inst.

That the Hardware business of J. T. Emmons, Greenfield, Iowa, is now being carried on by W. F. Brandon.

That Edmund H. Coombs, son of the late J. Marsh Coombs, will, about February 1, embark in the wholesale heavy Hardware business at Fort Wayne, Ind. Harry Shirk, Frank Woods and Nelson Thompson, of the old firm of Coombs & Co., will be associated with Mr. Coombs.

That Hinds & Hedges, Lyons, Kan., have sold out their Hardware and Implement business.

That the Hardware stock of R. M. Essick, Sabula, Iowa, has been purchased by a new firm, the style of which is Schroeder & Butzlof.

That Marple & Wharton, Hardware merchants, Yates Center, Kan., have disposed of their business to Rankin Bros.

That Hoffman Bros.' Sedalia, Mo., have disposed of their Hardware stock to J. M. Offield, who will hereafter conduct the business. The consideration was about $12,000.

That George E. Reiner, Girard, Kan., has very much enlarged his facilities for the prosecution of his Hardware and Implement business.

That Tilly Bros., Hardware store at Brazil, Ind., was entered by burglars on the 2d inst.

That the Scott Hardware Company, Freeport, Ill., have certified to a dissolution and surrender of charter.

That Mackey & Maley have recently entered the Hardware business at Rhodes, Iowa.

That burglars entered the Hardware store of Switzer Bros., Defiance, Ohio, on the 1st inst., and carried away a lot of Revolvers, Knives and Razors.

That the Hardware business of Sneed & Johnson, Streator, Ill., has been purchased by W. A. Johnson.

That John Harper of Terral, Ind. Ter., has decided to open a Hardware and Implement house at Ryan.

That the Hardware firm of Erickson & Hellekson, Wheaton, Minn., have been succeeded by Erickson, Hellekson & Co., Edward Boley having become a member of the firm.

That the Hardware store of Hewitt Dent, Rockford, Ill., was robbed recently.

That the Oxford, Miss., Hardware stores of W. J. Jenkins and Lewis & McKey were burglarized on the 7th inst.

That J. G. Burt's Hardware store, San Bernardino, Cal., has been reopened.

That M. Scheid & Son have purchased the Hardware stock of J. B. Frazier, Fairmont, Minn.

That the Hardware store of Reinhardt & Osborne, Louisville, Ky., was damaged by fire on the 9th inst. The loss is estimated at $1500, which is fully covered by insurance.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, January 27, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

A Remarkable Economy.

It may not be generally known that the Standard Oil Company are by far the largest consumers of tin plates in the United States. Their annual purchases reach an average of 750,000 boxes, or about one-third of the total imports. The tin plates are manufactured into oil cans, and a large proportion of the material is re-exported in this form, filled with petroleum. An interesting fact in connection with the subject was recently mentioned by a prominent New York tin plate merchant, as illustrating the way in which large economies may sometimes be effected by a little practical good sense judiciously applied. The Standard Oil Company for several years used a special size of coke plates—namely, 14 x 19¼ inches, each box containing 120 sheets, and giving material for 60 cans—two sheets forming the body of one can. Not long ago it struck one of the officials that the trimmings left over were excessive, and practically valueless. He accordingly set to work to remedy this waste, and soon discovered that two sheets of 14 x 18¾ inches would serve the required purpose equally well, and leave next to nothing in the way of waste material. The company have lately used special plates of this size, getting for the same price 124 sheets to the box, instead of 120 as before. They are, in consequence, able to make two more cans out of each box, or about 1,500,000 in the year, without the expenditure of another cent.

Factory Inspection.

The annual report of Rufus R. Wade, Chief of District Police of Massachusetts, for the year ending December 31, 1892, has just been issued in the form of a substantial volume of some 450 pages. The field covered by the report is broad, but the most prominent subjects are those concerning the enforcement of the laws relating to ventilation and other sanitary provisions in factories, school houses and public buildings; to elevators, provisions for escape in case of fire, safety from moving machinery, and in general to the well-being of factory operatives. The State of Massachusetts has always been a leader in legislation of this character, and this report is visible evidence of the practical value of the laws which stand upon the statute books. The report is, in fact, rather a collection of reports of the individual inspectors, compiled and arranged by the chief, and contains much of interest to every manufacturer. The general experience of the inspectors appears to be that the law is readily complied with when its provisions are made known, and that in the majority of cases the law is broken purely through ignorance. By far the larger portion of this report pertains to the ventilation of school houses and public buildings. Very complete plans and descriptions are presented of the heating and ventilating arrangements of a half dozen sample school houses, and serve as excellent instruction in this work. The inspectors, by several years of experience and numerous tests, have placed themselves in a position where they can judge reasonably well of the adequacy of any arrangement that may be presented in the plans which by law must be submitted before a building is erected. The recent amendment of this law, whereby the architect is made equally liable with the owner for failure to so submit plans, is reported to have had excellent effect.

Law Requiring Ventilation.

The law requiring good ventilation in school buildings was passed in 1888. It was at first received with a good deal of opposition, and a feeling that ventilation was nothing but a mystery. In the face of the fact that building contractors have had 50 years' experience with the present methods of heating, and only about five years with the improved systems of ventilation as now being generally adopted, the inspectors feel that they have met with marked success in the enforcement of the law. Among the plans presented in the report is one laid out by one of the inspectors and supposed to embody his conclusions, reached after extended experience. The planning of such a system, and its publication in this report are certainly for the good of the public; but when it is known that this arrangement was introduced—in accordance with these plans—in the district covered by the inspector who made them, the matter takes on a different aspect. As the acceptance of this school house by the district police depends upon the report of this inspector, it places him in the possible position of having to criticise his own work, something that most of us are not prone to do very severely. On the other hand, the report appears impartial in the presentation of the various plans, as both natural and mechanical methods of ventilation are shown, and no prominence is given to the names of the makers of the heating apparatus in the various buildings. Accompanying the report of each inspector is a list of plans submitted to him, with the changes recommended. These cover fire escapes, ways of egress and the like, as well as changes in ventilation. A general schedule gives the number of school rooms and the supply and exhaust in cubic feet per month per occupant in a large number of school houses in the State. No average is given, but the supply ranges very closely around 30 cubic feet, which represents the figure sought by the inspectors and considered by them as representing good ventilation. As the results in the schedule are stated to be based upon an average of 45 persons per room rather than upon the actual seating capacity in each room, they may be open to criticism, although there is no direct evidence of inaccuracy of results obtained by this method of averaging.

Boiler Inspection.

The inspection of boilers does not come directly under the duties of this body, but the appointment of a special inspector for one year, who should report to the chief of district police, is the cause of such a report being presented. It is excellent in its way, and covers a new field; for by provision of the act of appointment inspection was made only of uninsured boilers. As stated, the result of this inspection "is of the gravest importance, and suggests the imperative need of additional work in the same direction." The inspection included the boilers of the State institutions. Altogether, it covered 171 boilers, of which 23 were found without apparent defect. The total defects were 486, of which 114 were considered dangerous. Incompetency of firemen, engineers and janitors is commented upon severely. It is stated that "as a general rule the janitors in schools were found not to have had any experience at the time they become janitors." This only corroborates the testimony of those who have to do with the installation of steam heating and ventilating systems in buildings of this description. And the suggestion of the inspector that every engineer should be required to pass a satisfactory examination and receive a license before operating an engine would, if properly seconded by legislative action, remove much of the present objection to mechanical heating and

ventilating arrangements in public buildings.

Edward Atkinson, the well known economist, who has been gathering statistics of the present number of unemployed in the United States, says that the largest figures that can be claimed on any reasonable showing is 1,150,000. *Bradstreet's*, after careful investigation by its agents throughout the country, places the number at 800,000. But, as Mr. Atkinson points out, these figures must not be accepted as indicating the number actually thrown out of employment by the industrial depression, as it includes the great body of chronic idlers and those of uncertain employment who are always with us, even in the times of greatest activity. In his judgment those classes comprise two-thirds of the number of persons now returned under the head of "unemployed."

Students' Gathering at the Trade School.

In response to invitations to attend a students' gathering at the New York Trade School, to hear Chauncey M. Depew and other speakers, about 400 scholars, instructors, tradesmen and a number of ladies assembled in the large lecture room at Sixty-seventh street and First avenue, New York, last Tuesday evening. Among those present were: President R. Fulton Cutting, A. K. Mackay, J. Pierpont Morgan and Wm. E. Dodge of the trustees, and Edward Murphy and James Muir of the Plumbing Committee; John Beattie, T. L. Taylor, John Noll and L. Reiss of the Painters' Committee; James Hughes of the Masons' Committee, and Stephen M. Wright, Thomas J. Byrne, J. A. Rossman, and Wm. Schimpf, a graduate of the plumbing class of the school. The guests were received and seated by Harry Brill and J. Stanly Thomas, aided by several students as ushers, who distributed an attractive programme printed by the class in printing, '94.

At 8.25 p.m. R. Fulton Cutting introduced John Beattie who addressed the audience on "The Relation and Possibilities of the Trade School to Mechanics." In his address he said: "Thirty-six years ago I entered the painter's trade when a boy, was taught all parts of it, but in the competition for money making no time was left to teach the boy, and the question arose, Where shall we get our future mechanics? From my experience boys learn in a term here more than they could in two years in a shop. Make much of this start in learning your trade and continue to learn after you leave. Do your work honestly always and reflect credit on this grand institution."

James Muir was then introduced and spoke on the "Privileges and Possibilities of the Plumber," saying in brief: "I would counsel you to pay careful attention to your instructors, that your workmanship may be neat, but remember that the plumber shares with the doctor the responsibility for the public health. Learn all about sanitary matters, that sewer air and foul gases may be excluded from a building. You have a better chance than I had, and I know that boys learn more here in months than I did in years. In these days a sanitary plumber means more than a sign and a shop. It means a thorough knowledge of cause and effect. A copy I used to write at school was, 'Perseverance overcometh many things.' Keep at it and you can be a sanitary plumber. I don't know as I will say any more. I have said enough." The applause was such that Mr. Muir again spoke, saying: "The president called me first because he thought I couldn't do well after Mr. Depew. Boys! I'll tell you! All plumbers make mistakes! Don't be discouraged by yours and don't repeat this one. I sent a man to see why a tank was empty and he started a force pump without opening the cock at the tank. The result was he pumped the head out of the boiler and flooded the kitchen. But he works for me yet. He came back honorably and explained. I went to see the damage and the cook told me that luckily she was working on an upper floor or she would have been burned to death."

Chauncey M. Depew was then introduced.

MR. DEPEW'S ADDRESS.

In his address Mr. Depew said:

"I am glad to speak with men who amount to something like plumbers and painters and am glad to meet you here. Later in life you will appreciate the grandness of the institution and the great work of its founder and the invaluable opportunity that is here extended to the young men of this country. Colonel Auchmuty has conferred an invaluable favor on you all and others to come. Here you learn a trade, and in one term almost commence where other men leave off. In the Old World a young man must pursue a long, weary path. Here in this country of opportunities the public school educates a boy beyond his father and the trade school fits him at the start for labor that old workmen cannot perform. Every day I have men with college education applying for work for which they lack the special training. They must either go back and study some branch thoroughly or go through weary years of drudgery before they are valuable. You surpass such men on leaving here by possessing a special training which makes you valuable men at once. Make much of the opportunity and always be studying. There is a demand for you. Over 100,000 expert foreign workmen come here every summer and work and go home in the winter. You can fill their places if you know your trade thoroughly and work at it earnestly, and act absolutely honestly in everything. A man who is too well educated to carry a hod or be a plumber's helper, and who, from want of special training, cannot be a lawyer or a doctor, is at a disadvantage compared with you. To forge to the front is not easy, but honest, intelligent perseverance will put you among the leaders. Too many men work eager for quitting time. Some work to accomplish something. They do their work and can let another fellow go to a ball match or a yacht race. Such a man soon bosses a shop. You have as good a start as Commodore Vanderbilt. He had legs and brains. In youth and health you have energy; in legs you have transportation; in brains you have the management of the machine. I made a place the other day for a man who had walked 40 miles and impressed me that he could work and was willing. He will be valuable later on and I could not do without him. Be honest! A man once made $2000 out of me through sharp practice, and in relating my experience as a joke he lost an opportunity, through his dishonesty, to make an independent fortune. I want to call your attention to two words, one for idots, the other for wise men. 'I can't' makes tramps, loafers and miserable men. 'I won't' is one of the best in the English language. It means I won't drink or do this, that or the other that is useless or degrading. It makes manliness in youth and independence in old age. Of 50 men who grew up with me, eight-tenths are dead and rum is at the root of their early decay. The others own property and are honorable men. Boys, there is lots of fun without intemperance; lots of fun without reckless indulgence. Don't indulge in a luxury till you can afford it. If you make a dollar a day, save 10 cents. If you make more, save more. You may be told you are mean and have disagreeable things done to you; but when you have got your first hundred dollars you will feel so good that you will walk around among those people and say: 'Old man, you cannot do that again.'"

Mr. Depew probably never spoke to a more attentive and appreciative audience. After a vote of thanks to the speakers for the entertainment, the gathering dispersed.

"Merchants of Our Second Century" is the title of a work that is soon to be issued by the widow of the late G. G. Hallett. That no expense has been spared in its preparation is apparent from an advance copy. A historical design in gilt is a feature of the covers and the binding is very handsome. The text of the book consists of over 100 pages, is a fine specimen of the printer's art, and has been compiled with great care to make it valuable as a historical record. Steel engravings are profusely used, showing lifelike portraits of many notable business men, with a brief sketch of their career. In addition to these are portraits of all the Presidents of the United States, and a full account of the celebration at the beginning of our second century, with the addresses that were made. C. F. Diehm, 27 Union square, New York, is the publisher.

At Chicago, on the 13th inst., Judge Jenkins in the United States Supreme Court entered a decree affirming the sale of the plant of the United States Rolling Stock Company to Thomas F. B. Parker for $350,000. The decree provides that $35,000 is to be held by the court until the claims of Carnegie, Phipps & Co., Hibbard, Spencer, Bartlett & Co. and A. L. Adams are decided. The sum of $16,799 is to be applied at once to the payment of part of the indebtedness of the company under the first mortgage bonds. The bondholders are to receive 5 per cent *pro rata*, without discrimination between principal and interest. Judge Jenkins also denied the petition of Carnegie, Phipps & Co. in the United States Rolling Stock Company case asking for the discharge of the receiver.

Mayor Hopkins of Chicago has hit upon a plan for clearing the city of idle tramps and vagrants who are unwilling to work on the streets in return for meals and lodgings. He has issued orders that every man who applies at the police stations for lodging is to be offered work. If he refuses he will be driven by the police out of town.

THE LETTER BOX.

A Warning.

We have the following letter from W. T. Twitmire, Bellefonte, Pa., which explains itself:

A man is going over the country and passing bogus checks who operates in this way: He comes into a town, rents a house and strikes a stove man for a good stove and a whole outfit of tinware, piping, &c., and in payment gives a check larger than the amount of his bill, getting the balance in money. The last I heard of him he was in Sunbury, operating in this way. I would like to see the work stopped, and would help to prosecute him. He puts the stoves into the house before he leaves town to get his family. He is a large man, about 5 feet 10 inches in hight, probably 55 years of age, weight 175 or 180 pounds, smooth face, and when here wore a small brim slouch hat. He indorses the checks as "Thomas Smith," the checks being drawn on New York banks. The one here was on the Farmers and Mechanics' Bank of Elmira.

The Tin Plate Gauge Marks.

From C. B., *New York.*—Will you kindly inform me through the Letter Box what is the full meaning of the initials "IC" as applied to tin plates?

Answer.—The origin of the letters IC, IX, &c., as describing the gauge of tin and terne plates appears to be wrapped in the mist of obscurity. No history of the trade, so far as we have been able to observe, explains their actual meaning or states when they were first used. Whatever original meaning may have been attached to the letters has, however, been lost in the course of time, as they are now mere arbitrary signs, IC designating the thinnest gauge of plates, IX a thicker gauge, IXX a still thicker plate, and so on. The most plausible conjecture as to the original meaning of IC is that it represented a hundredweight (112 pounds), the "C" being written as an abbreviation of hundredweight. It is further supposed by some authorities in the trade that IX, on the same principle, was used to designate an extra weight of sheet, the additional crosses following naturally to mark those still heavier. One of the oldest men in the tin plate trade, whose opinion on the subject was asked and whose experience dates back to the '50s, states that he has never met, even among the oldest manufacturers, any one who knew the meaning of the marks. Most of them, he observes, exhibited very little curiosity on the subject, taking the ground that "they had always been used." This authority inclines to the belief that they were originally mere arbitrary marks, made probably by common workmen to designate the material they were accustomed to handle. For many years the term "slight" applied to the lighter or thinner sheets, and one of our correspondents suggested that some phonetically inclined workman took *c-light* as a symbol for slight, omitting for brevity's sake all but the *c*. However that may be, the whole subject of the origin of the marks appears to be no more than a matter of conjecture. We should, however, be glad to hear from any readers of *The Metal Worker* who may be able to throw light on this interesting question.

Noise in Boiler and Pipes.

From F. R. M., *Warrensburg, N. Y.*—Will you kindly inform me through the Letter Box the cause of a jarring, rumbling noise in pipes and boiler which starts upon opening a hot water faucet in any part of the house? The noise can be heard all over the house, no matter in which room the faucet is opened, and sounds as though the pipes and boiler would be torn to pieces. The boiler holds 32 gallons and the pipes are ¾ inch.

Answer.—The trouble in question is probably due to one of two causes. Where there is a strong water pressure, oftentimes, on closing the water faucet quickly, the jar is transmitted to the fixtures with such force as to cause a trembling and a rattling, as described. Another cause is due to the generation of steam where the pressure of water to supply the boiler is very light, which allows steam to accumulate at the top of the boiler, in the water back and in the circulating pipe. Immediately on the opening of the hot water faucet, cold water rushes into the boiler to take its place, and the steam that may be at the top of the boiler is at once cooled and condensed, leaving a vacuum, which is filled by a rush of cold water, and where the water meets the result is very similar to bringing a hammer down upon an anvil with the same force. Condensation and vacuum may be formed in the return pipe from the water back, or in the water back, by the steam coming in contact with a cold part of the pipe or cold water entering the water back.

Location of Air Supply.

From SNIPS, *East Hampton, N. Y.*—In answer to "W." of Warsaw, N. Y., who responds to the query of "Snips" in the issue of December 2, the register manufacturers give the capacity of a 10 x 14 register, less the grating, as 93 inches. A 10-inch pipe is equal to 78 inches only. A pipe of 10 inches diameter could be put in a 9 x 14 register box in an oval form, or the box could be made extended to take in pipe of that size.

Boiler Too Large.

From S. E. K., *Ohio.*—I have connected a water front in a 7-inch portable range with an 80-gallon boiler, and since doing so the range works slow in baking and cooking and the boiler never becomes so hot in the lower portion that discomfort is felt from placing a hand upon it—in fact, near the bottom it is always cold. Sometimes the water drawn from the boiler is scalding hot, even when the boiler is cold at the bottom. There is no noise and the circulation seems to be easy, and though I put in a large boiler so as to furnish plenty of hot water, my customer does not get enough and has to wait too long for it; besides, the stove works too slow and ashes accumulate very quickly against the water front. Where does the trouble lie and what shall I do to remove it?

Answer.—The boiler is too large for the fire, consequently the water keeps the water front cold, which chills the fire and makes it dead next to it for some space out into the fire chamber, and the air which passes through the dead coals cools the top of the range and the oven more than the remaining narrow strip of fire can overcome. This accounts for the slow operation of the stove. It is a common error to use boilers that are too large, with the idea of having an abundance of hot water, and the result is frequently a large quantity of water that is warm but not hot enough to prove satisfactory. A small quantity of water such as our correspondent calls "scalding hot" will mix with a large quantity of cool water when warm water is needed, which shows that hot water is the most useful. The water in a small boiler can be quickly made hot and does not absorb so much heat from the fire as to interfere with the operation of the stove. To answer the questions put, the large boiler is the cause of the trouble. A 25-gallon or 4-foot by 12-inch boiler is a better size to use with the stove described, though some might prefer a 30-gallon boiler. If a water back, properly constructed so as to avoid air and steam pockets, and a small boiler is used, set so that the bottom is above the water back, and the connections between them are made with large pipe and one size larger pipe is used for the return pipe to the boiler, circulation will be free and there will be no noise. Small boilers will be found more satisfactory in the majority of cases for supplying hot water. The use of boilers that are too large is a common error. Frequent attention to the fire to keep it bright and free from ashes when a large

quantity of hot water is needed with a small boiler will enable it to supply it satisfactorily.

A Letter from the Hawaiian Islands.

From J. E., *Honolulu, H. I.*—The year just closed has been an eventful one in the history of our island community. January 17, 1893, will go down to posterity in our reef bound home as the day when the people declared themselves forever free from a dissolute, wasteful, semi-barbarous monarchy, and took steps to secure the union of these islands to the United States. Since then much has been said and written on the situation, and the anniversary of the day will probably see all the evidence that has been collected up to that time laid before Congress. The last act in the drama on this side of the water has been the demand of your Minister for the Provisional Government to vacate the situation in favor of the ex-Queen and the reply of President Dole and the Councils to his demand, both of which I inclose as published in the local papers to-day.

They speak for themselves. I am a resident of these islands for the past 16 years, in business for myself 12 years, and profess to know something as to the conditions under which we have existed in the past, and therefore say that if the acts of George III justified the revolution of '76, then surely our little revolution was equally justified by the acts of Liliuokalani. We hope that Congress, as a matter of justice, will request the resubmission of the treaty of annexation withdrawn by Mr. Cleveland on his accession to the Presidency, and that a commission may be appointed to come down here and inquire fully and thoroughly into this matter.

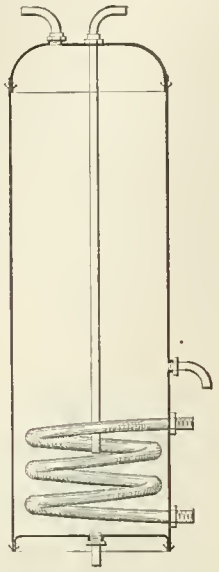
It is deplorable that Mr. Blount was so prejudiced against the manner in which the revolution was brought about, and used it as a pretext to besmirch the character and acts of Jno. L. Stevens, the American Minister at that time. This was done through inviting royalist evidence, while only two of the 13 members of the Committee of Safety were given opportunity to testify before Blount. As a member of that committee and of the present Advisory Council I have lately subscribed with other members to an affidavit declaring that neither before nor during the progress of the revolution had there been any arrangement or understanding between the American Minister and revolutionists, and that we neither expected nor had the assistance of the United States Marines in that crisis. As before stated, we hope Congress may see fit to act with a due regard for the interests that are being sacrificed by reason of the protracted delay in negotiations. Should nothing be done by that body, we intend to immediately put our house in order, establish a republic with as liberal a franchise as may be compatible with our purposes and quietly wait until the people of the United States, through the election in '96, may have an opportunity to pass on our proposition, which will undoubtedly be resubmitted after March, 1897.

These islands are in every sense an American colony and dependency, and must finally be accepted in some way into the federation of States. May God speed that day, is the sincere prayer of every well-wisher of the Hawaiian race.

Business has naturally been dull during the past year, but that makes no difference with our subscription to *The Metal Worker*.

Boiler with Steam Coil.

From J. B. R., *Atlanta, Ga.*—The building I am in is heated by steam, and I want to have a supply of hot water for my work. I can get the steam and water readily enough, but am undecided about heating it. I am recommended to use an ordinary kitchen boiler with a steam coil in to heat the water. I know that an upright boiler



Boiler with Steam Coil.—Fig. 1.—Upright Boiler with Spiral Coil.

is preferable where a water back is used, but a horizontal boiler could be used to better advantage, so far as space is concerned, if it is just as satisfactory in operation. I send you a sketch of the two boilers recommended, and would like your opinion as to which is the better. Fig. 1 shows the upright boiler with a spiral coil, and Fig. 2 shows the horizontal boiler with a return bend coil in it. The upright boiler has the usual openings for a water back connection, which can be used at the time of year when steam is not employed for heating, and the openings can be plugged when the water back is not used. I am told that the horizontal boiler can also be furnished with these openings.

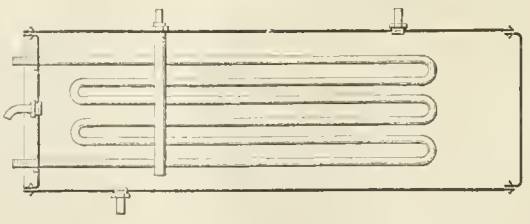


Fig. 2.—Horizontal Boiler with Return Bend Coil.

Answer.—There is no difficulty in heating water by steam passing through such a coil as is used in either of the boilers shown, providing that the boiler and coil are set so that the water of condensation can run off. The hot water at the top of an upright boiler would not be so quickly subjected to the cooling influence of cold water that would enter the boiler to take the place of hot water drawn off as it would in the horizontal boiler. Aside from these there is little choice between the two styles. The same would be true when connected with a water back, except that there would be a slight difference in favor of the circulation in the upright boiler. Horizontal boilers with a steam coil can be furnished with openings for water back connections. If the horizontal boiler is most convenient, there is no reason against its selection. The pressure of steam and the size of the boiler regulate the length of the coil. Ordinarily, however, 1 lineal foot of 1-inch pipe is used for every 5 gallons of water to be heated.

Paste Stove Polish.

From C. K., *St. Louis, Mo.*—Can The Letter Box or some of its readers give me a receipt for making a good liquid and paste stove polish?

Note.—The Letter Box is open to the contributions of our readers on this subject. A stove blacker who had tried many different mixtures preferred the following for easy work and excellent results. Mix pulverized Ceylon lead with first-class asphaltum varnish until a paste of the consistency of putty is secured. Sometimes a few drops of litharge and oil of sassafras was added. In using, a small quantity of the paste is mixed with deodorized benzine and applied to the stove with a paint brush. A stove coated with this blacking may stand a day or two before it is polished and a good polish can be quickly secured.

Roofing Queries.

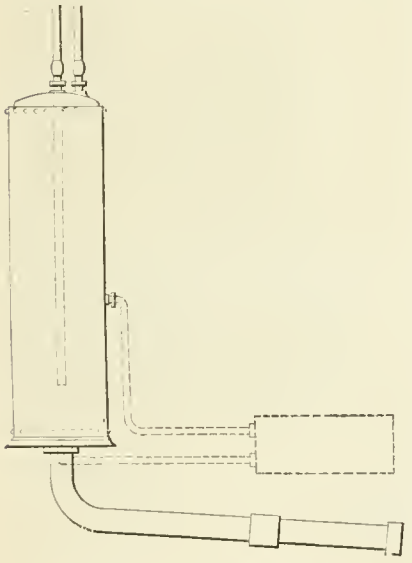
From S. P. K., *Topeka, Kan.*—This is the time of the year when, as a rule, the roofing readers of *The Metal Worker* are not so busy as they will be later on, and an exchange of experience on some of the minor details of roofing might be of advantage. I would like to hear from some of them as to the cost of standing seam roofing. How long does it take to edge a box of tin on an ordinary folder when it is to be used in strips for standing seam roof? Also, how long does it take to put a box of tin together, assuming that four rolls are used to a box? Then, if the tin is soldered in the rolls, how long does it take to solder a box of tin and how much solder is used? Then I would like to know what is considered an average day's work. I reckon about 600 square feet is a day's work for a man when the roof pitches two ways and a hanging gutter is used to catch the water. I would also like to know the different ways they finish at the edges. These are plain every day questions, but a review and comparison of these items which bear on the cost of the work from different parts of the country will be interesting.

Note.—We hope our readers will respond to the request of this correspondent from their experience with such sketches as may be necessary to show their methods.

Better Than a Water Back?

From G. M., *Camden, N. J.*—A friend of mine contends that better results can be secured from a kitchen boiler by running a pipe from the bottom of it to the fire and extending into it some 6 or 8 inches than can be secured with the usual water back connection. The illustration presented herewith shows his idea in the large pipe from the bottom of the boiler, which he claims must be of twice the capacity of the pipes ordinarily used to accomplish the results which he claims. The dotted lines to the boiler show the usual pipe connections to the water back. He claims the water will circulate through the single pipe the same as if connected in the regular manner, because hot water ascends and cold water descends. We have left the matter with *The Metal Worker* for a decision.

Answer.—The idea advanced is not new, and if the device possessed the merit which is claimed, the more ex-



Better than a Water Back?

pensive water back connections of to day would have long since been supplanted by it. That circulation of water will take place in such a pipe is true, but in an irregular way. In operation the device would have a tendency to create steam, and there would be a continual struggle for the hot water to find an exit against the pressure of the cold water. The water in the extreme end when the fire was excessively hot would be rapidly generated into steam, and the continual condensation and creation of vacuum to be filled by an inrush of water would be a severe strain on the piping, and create a noise that would be anything but pleasant.

Fails To Bake On Bottom.

From FORTUNE, *Philadelphia.*—In reply to "W. S.," who inquires in *The Metal Worker* of December 20 for the reason why ranges sometimes fail to bake on the bottom, would say that in our experience with these complaints the fault has been found principally with the management of the range. The most common fault is that the article to be baked is placed on the oven slide, which brings it so near to the top oven plate that it burns at the top before the bottom has had time to bake. In our opinion, the only proper place to bake is on the bottom plate of the oven. Another common fault is too hot or too high a fire. A sluggish draft is also sometimes the cause. That a chimney draft will draw up a lighted newspaper is not positive evidence that there is a good draft. In more than 95 per cent. of complaints of this kind we have not found the trouble to be in the range, and we think that if dealers would go to the trouble to bake in a range themselves, even if it takes several hours of their time, it would save them and the manufacturers a lot of trouble.

Computing Area and Capacity.

From W. F., *Warren, Ill.*—Having seen the question asked in *The Metal Worker*, "How shall I find the capacity of a furnace pipe?" and never having seen the rule that I use published, I give it for what it is worth. It may not be absolutely correct, yet for ordinary purposes it will furnish good results, and is much easier than the majority that I have seen given. Multiply half the circumference by half the diameter. For instance, take a 10 inch pipe. The circumference is 31¼ inches; half the circumference is 15¾, half the diameter is 5; $5 \times 15\frac{3}{4} = 78$, and is within a fraction of the true capacity of the pipe. To find the capacity of a round vessel, with sides that are straight and a diameter that is the same at the top and bottom, multiply half the diameter by half the circumference and the result by the depth, which will give the number of cubic inches contained in the vessel. Divide this result by 231 and you will have the capacity of the vessel in gallons, or by dividing the result by 2150.42 you will have the number of bushels the vessel will contain.

Note.—But for the allowance for the thickness of the metal our correspondent's rule for the capacity of a pipe is absolutely correct. Half the diameter multiplied by half the circumference will give the exact area of a circle, all that is necessary being to know precisely what the diameter and circumference are.

Rattling Noise in Boiler.

From A SUBSCRIBER.—There is a boiler in use in my town which, after the fire has been started in the stove for some time, makes a rumbling noise, which continues for an hour or so. It is a low pressure boiler and the expansion pipe is open and the tube is in the right place in the boiler. There is no trap in the connecting pipes and yet the noise continues. We shall be glad to receive any suggestions as to the cause from either *The Metal Worker* or its readers.

Note.—Our readers may have some opinions to express on this subject. In the meantime, we would suggest that the noise is due to imperfect circulation, caused by some defect in connections. Some of the things that could be done to relieve the trouble would be to raise the bottom of the boiler so that it would be above the top of the water back, that the pipe leading from the boiler to the water back would have a positive descent. The pipe which carries the hot water to the boiler should be one size larger than the lower pipe. All the joints should be wiped so that they will be free and open. If the couplings used have a leather washer care should be taken that these washers do not protrude into the waterway, to reduce its size and create an eddy. Some small and loose obstruction that can move will oftentimes create an eddy which will cause vibration through the pipes and make a noise that is heard in the boiler. If the trouble is in the pipe that supplies the boiler, the supply may be so reduced as to aid in the generation of steam. If the steam passes to the boiler before it condenses the noise would be in the boiler. Some seemingly small detail is different from what it should be, and must be found and changed to stop the noise. The principles which govern circulation are understood by our correspondent and will be his best guide in hunting for the little thing that causes the trouble.

One of the largest real estate transactions on record was consummated a few days ago, in the final transfer by the State of Florida to the Atlantic and Gulf Coast Canal and Okeechobee Land Company of 2,000,000 acres of rich land in the heart of the semi-tropical region of Florida. The transfer was the outcome of a contract entered into between the State of Florida and Hamilton Disston, of the well-known firm of Philadelphia sawmakers, who is president of the above named corporation, by which the latter undertook to reclaim the vast tract of country in the vicinity of Lake Okeechobee, theretofore subject to constant inundations. The work has been successfully completed after 12 years of hard work and a large expenditure of money; and a continuous waterway of 350 miles has been opened from Kissimmee City to the Gulf of Mexico, which will be of the greatest benefit to Florida. The grant to Mr. Disston's company in recompense for these services places about 3125 square miles of land at their disposal.

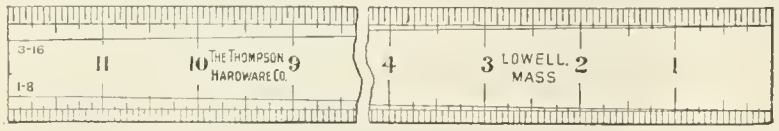
Apropos of the present agitation for the strengthening of the British navy, it is interesting to note that the tonnage of war vessels launched in England last year was very much less than that of several years preceding. The following indicates the total number and tonnage for five years, without including torpedo boats:

	Vessels.	Tons.
1889	31	52,110
1890	20	64,260
1891	19	107,985
1892	22	141,300
1893	14	33,330

The latest advices from Australia speak of great distress among the unemployed in that country. To relieve the depression South Australia is locating a co-operative community, aided by the Government, on a million acres of land in Kangaroo Island, which will be occupied at starting by 1000 unemployed. Some of the other colonial governments are also granting tracts of land for a similar purpose.

Improved Shrinkage Rule.

The Thompson Hardware Company, Lowell, Mass., are offering the 12-inch scale shown herewith, especially designed for the use of pattern makers and draftsmen, or others who are interested in the shrinkage of the various metals. Upon the four corners of the scale are drawn lines parallel with the edges of the scale. Beginning at the end of the scale and at the parallel lines are drawn supplementary lines at an angle to the parallel lines and the distance these lines are apart at the opposite end of the scale is determined by the amount of shrinkage it is desired to indicate.



Improved Shrinkage Rule.

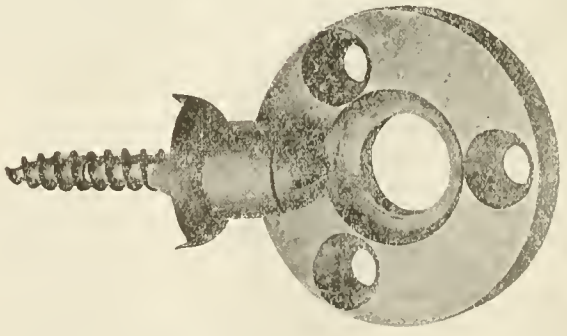
Thus for iron the lines are apart $\frac{1}{8}$ inch at the end of the 12-inch scale, as iron shrinks that amount per foot. For brass the lines are $\frac{3}{16}$ inch apart. For iron and brass combined $\frac{5}{16}$ inch and for a double brass shrinkage $\frac{3}{8}$ inch, &c. Therefore, to find the shrinkage for any amount, say 10 inches, it is only necessary to add to the standard measurement the distance the lines are apart at the 10-inch graduation. This method, while combining four different shrinkage rules in one, in no way interferes with the use of the scale for standard measurements. It is explained that in making patterns for castings it is necessary to allow for the shrinkage of the particular metal or composition used in making the casting, and if the casting is to be for a metal pattern from which other castings (possibly of a different metal) are to be made it is necessary to estimate not only the shrinkage of the final product but also the shrinkage for the metal pattern. It has heretofore been customary to make use of arbitrary rules so graduated that the divisions exceeded the standard divisions in proportion as it was necessary to compensate for the shrinkage of the metal or metals used. This, of course, necessitates the employment of a large number of scales of different dimensions. It is also customary for draftsmen to estimate for shrinkage by allowing a fractional part of an inch for each inch of measurement, according to the metal used, both of which it is the object of this invention to avoid. The rules are finely graduated and are warranted accurate by the manufacturers.

Advices from Hartford, Conn., are to the effect that throughout Central Connecticut there are evidences of a steady revival in the industrial situation. It is claimed that Hartford has suffered comparatively little, that no factories have been shut down, and that hands who were laid off are gradually getting back to their work.

A notable figure passed off the stage in Baltimore, Md., last week, in the person of George W. Skinner, the veteran shipbuilder, who died at an advanced age. He learned his trade with his uncle, Zackariah Skinner, the pioneer shipbuilder of Baltimore, and later, in conjunction with his father and two brothers, acquired a great reputation as builder of some of the most famous of the old clipper ships. George W. Skinner was the designer of some of the fastest sailing craft ever built.

The Standard Pattern Dowel.

The illustration herewith given represents a new pattern dowel offered by W. S. Hawker, Broad and Adria streets, Philadelphia, Pa. In use the plate is placed at random in the drag half of the pattern by boring a hole of a diameter and depth to match the plate, after which the plate is placed in the hole and the pin dropped in position in the plate, without the screw, however. The small sharp points on the base of the pin now project slightly above the surface of parting. On the points the cope half of the pattern is now placed in position and matched around the edges, after which it is lightly tapped with a mallet, thus embedding the points in the cope half of the pattern. The cope half is now taken off and the round headed screw is driven through the pin, completing the job. It is explained that by reason of the pins being in their true position within the plates when the pattern is matched there can be no binding of the parts, and that the placing of the three or more pins at the same time is greatly simplified; also that either part of the pins may be easily taken out and replaced with perfect accuracy in case of alterations, and, as they may be used repeatedly, the makers claim that they are cheaper to use than wooden dowels. The dowels described have been designed with special reference to close economy as regards placing them in patterns and the obtaining of perfect accuracy in matching partings. The manufacturer claims that the difficulty usually experienced in matching partings with various forms of metal dowels is entirely obviated in these. The dowels are made in four sizes: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{5}{8}$ inch, samples of which will be sent by the maker upon application.



The Standard Pattern Dowel.

The Commissioner of Navigation at Washington has decided that the vessel "Augusta," formerly the property of citizens of Venezuela, but now belonging to the Neafie & Levy Ship and Engine Building Company of Philadelphia, is entitled to American registry. The decision has given much satisfaction in the Quaker City, as it means, among other things, the employment of a number of Philadelphia machanics in rebuilding the vessel.

Aluminum Hollow Ware.

In an article on aluminum prepared for the 1892 volume of the "Mineral Resources of the United States," Captain Alfred E. Hunt of Pittsburgh says: The production of cast aluminum hollow ware has just been started as a new industry that will undoubtedly be successful. Aluminum tea kettles are now on the market, and aluminum coffee pots and tea pots will soon follow. Hollow ware castings have been successfully made in the form of tea kettles, with only $\frac{1}{16}$ inch thickness of metal in the walls of the kettle, which is a remarkable evidence of the good casting qualities of aluminum. Another advantage which may be incidentally spoken of here is that these castings are more malleable than those of any other metal. Thin castings of aluminum tea kettles have been hammered in and bent almost double before breaking. The Smith pressure casting process has been very successfully used for casting aluminum articles by the Passaic Art Casting Company, of Passaic, N. J. By this process the finest details of the engraving, chased and *repoussé* work are brought out in aluminum castings with a finish equal to that of electrotypes. Molds either of sand or of a liquid plaster of Paris composition are made in as flat a shape as possible, so that they may be piled on top of each other; the gates from each mold leading to a central sprue. The effective penetration of the molten aluminum to every part of the matrix is secured by the collection and temporary detention of the entire charge of molten metal in a suitable holder above the molds, where a prompt and continuous transfer of the molten metal from the bottom of the holder to the matrix cavities is obtained by the aid of increasing the pressure at the rear and decreasing the pressure in front of the advancing stream of molten metal by means of a piston covered with asbestos, which fits closely into the cylinder above the receiver for the molten metal, the mold itself being air tight and in connection with the vacuum tank of an air pump. A thin diaphragm of asbestos used to hold the molten metal in the receiver before it enters the mold is burst by the pressure placed upon the metal by the piston, allowing it to flow suddenly into every minute cavity of the mold. Extremely light and sharp aluminum castings, having a remarkable solidity and freedom from blow holes, are obtained by this process.

The Commissioner of Navigation at Washington has decided that the vessel "Augusta," formerly the property of citizens of Venezuela, but now belonging to the Neafie & Levy Ship and Engine Building Company of Philadelphia, is entitled to American regis-

PLUMBING and GAS FITTING.

Domestic Electrical Work.*—VIII.

By W. A. W.

Automatic Fire Alarms.

All the alarms described up to this time have been what might be termed manual—that is, it has required a manual operation to start them, either intentional or otherwise. We now come to that class which are strictly automatic—that is, they will perform a certain duty under certain circumstances without any attention or manual assistance. In this class are included temperature regulators and fire alarms, but as the former are extensively advertised in connection with heating apparatus and full directions for their application furnished with each outfit, we will not consider them.

The apparatus used for fire alarms varies with the requirements of the case. If it is only desired to make known the presence of fire in the building an ordinary electric bell will answer the purpose. In large buildings, however, containing many rooms it is of the utmost importance to know at the earliest possible moment on just which floor or in just which room the fire is located. In this case an annunciator must be used. In an establishment

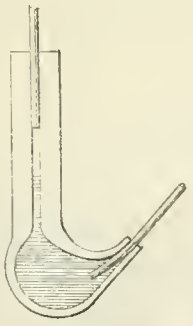


Fig. 15.—Electro-Mereurial Fire Alarm Bulb.

where a watchman is on duty at all hours of the night, it is only necessary to locate a bell or annunciator at some point in the building where the watchman will be sure to have his attention attracted to it. In case no watchman is on duty the circuit may be carried to some neighboring point where an alarm would attract attention. It is, however, much better in the case of establishments having no watchman to run the circuit direct to the fire engine house, where if no other apparatus of this kind is already installed a simple electric bell will answer every purpose, placing an annunciator on the outside at the principal entrance of the building.

Fire departments, as a rule, will be found only too willing to have these private alarms connected direct to headquarters, as it is greatly to their advantage to be apprised of a fire while yet in its incipient stage. By placing the annunciator on the outside of the building the department, on arriving, can at once determine the exact location of the fire within. These appliances, while of the greatest importance in hotels, factories, public buildings and business houses, are also very useful in the dwelling house, not so much as a matter of necessity, but for the reason that they inspire a feeling of security, which every one loves to enjoy on retiring for the night. Fig. 15 shows the electro-mercurial alarm. This is a glass bulb containing mercury, constructed on the same principle as a thermometer, with a platinum wire fused in each end, the lower wire being in constant contact with the mercury, the upper one terminating just far enough above it to come in contact when the temperature for which it is set is reached by the column of mercury rising in the tube. These thermostats are usually inclosed in copper shields, to protect them against accidental breakage.

In installing a system of automatic fire alarms lay out the circuit as described for fire alarms in Chapter IV, and shown in Fig. 9, substituting the thermostats for the push buttons. The thermostats must, however, be placed in the ceiling, as in case of fire in a room the excessive heat would be felt there first. In large rooms they should be placed about 20 feet apart, so that the heat of a fire would in no case have to spread over 10 feet in any direction without affecting the thermostat. These instruments can also be used in connection with the alarm shown in Fig. 9, by simply connecting them as additional push buttons, and thus have a doubly secure system. The most important points in a dwelling to look after are the kitchen, basement (if a heating apparatus is used there), and around chimneys in the attic. These thermostats are usually set for 120° F., but when used in places where a normally high temperature prevails they can be had set to a higher degree.

For the benefit of those who wish to make their own thermostats the one shown in Fig. 16 will be found as efficient an instrument as can be constructed. A strip of spring steel about the thickness of No. 26 iron, 7 inches long and $\frac{1}{2}$ inch wide, and a strip of hard rubber of the same size about $\frac{3}{32}$ inch thick, securely riveted together makes an excellent thermostatic bar. Fasten one end of this bar and allow the other free play. Then place the set screw as shown. Make electric connections with the set screw and with the fastening, and the thermostat is complete. The difference in expansion and contraction being so great between hard rubber and steel a change of 1° of temperature will cause the bar to warp one way or the other, bending toward the steel with a rising and toward the rubber with a falling temperature. This thermostat also possesses the advantage of being adjustable in case circumstances should require a change.

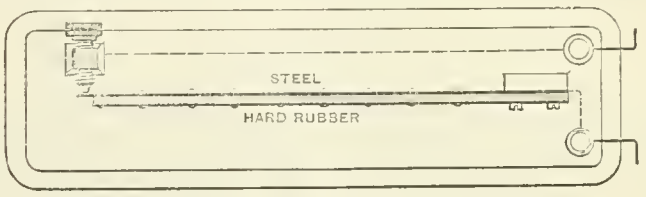


Fig. 16.—Rubber and Steel Thermostat.

* Copyrighted 1893 by David Williams.

Connecticut Master Plumbers.

The following notice is being sent to members of the Connecticut Association of Master Plumbers from New Haven, dated January 22, 1894:

The fourth annual convention of the Connecticut Association of Master Plumbers will be held at Hartford, Conn., on February 15, 1894, at 10 a.m., in Putnam Phalanx Armory, 6 Haynes street, corner of Pearl. Your presence is requested, and it is very desirable that every member should be in the hall at 10 a.m. prompt.—S. E. Dibble, president; James Ahern, J. B. Weiant, A. J. Clerkin, C. S. Eames, R. H. Stothart, L. H. Mills, Executive Committee.

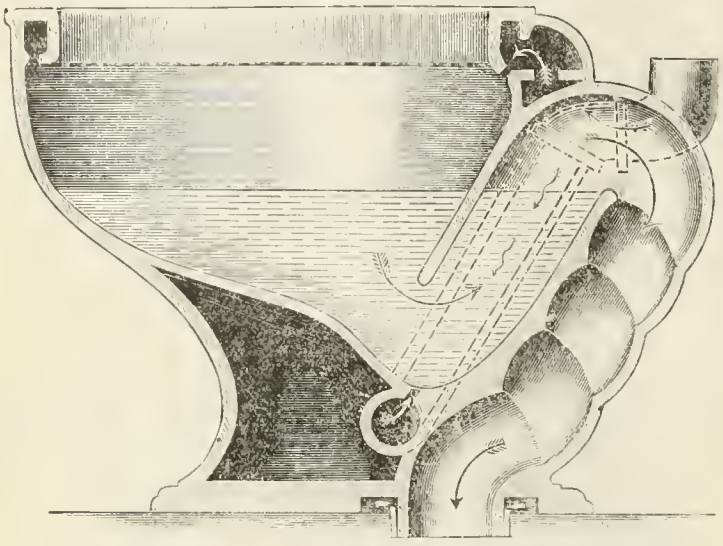
President S. E. Dibble of 639 Grand avenue, New Haven, has perfected the preliminary arrangements for the banquet and meeting places. The Hartford master plumbers are taking unusual interest in the affair and are very enthusiastic. Robert Morgan of 30 Center street, New Haven, who is chairman of the Sanitary Committee, is expected to give an interesting essay on "Sanitation in Dwelling Houses." George W. Minor of Waterbury will speak on the "Apprentices." Edward Mahl of Hartford will speak on "Plumbers' Legislation." Recording and Corresponding Secretary A. J. Clerkin of 779 Grand avenue and J. G. Shearlock, New Haven, will also deliver addresses.

Following the convention the 150 local members and guests will adjourn to the United States Hotel in the afternoon, where a banquet will be served.

The Metal Worker appreciates the compliments of the St. Louis Master Plumbers extended in the following invitation, with a ticket: "The Master Plumbers' Association of St. Louis respectfully request your presence at their grand ball, to be given at Liederkranz Hall, Thirteenth street and Chouteau avenue, on Wednesday evening, January 31, 1894. Arrangement Committee, D. J. Collins, chairman, Jeremiah Sheehan, Martin J. Ward, P. H. Callahan and John P. Kelleher."

The Bourse Syphon Jet Closet.

In honor of the new trade exchange building now being erected at Philadelphia, the Bourse is the name given by the J. D. Johnson Company, 139 and 141 North Seventh street, Philadelphia, to their new syphon jet water closet, which is illustrated herewith in sectional view. The feature of the closet, on which a patent has been granted, is the discharge passage, which is direct and spiral shaped. This, it is claimed, prevents its stoppage by sticks that may enter, or other matter likely to obstruct the force of water. The jet at the bottom of the bowl is said to lend additional force to the syphonic action, and the twisting shape of the passage to cause a whirling of the water that thoroughly scours every part. The closet has been used in a number of buildings, where it has given satisfactory results.



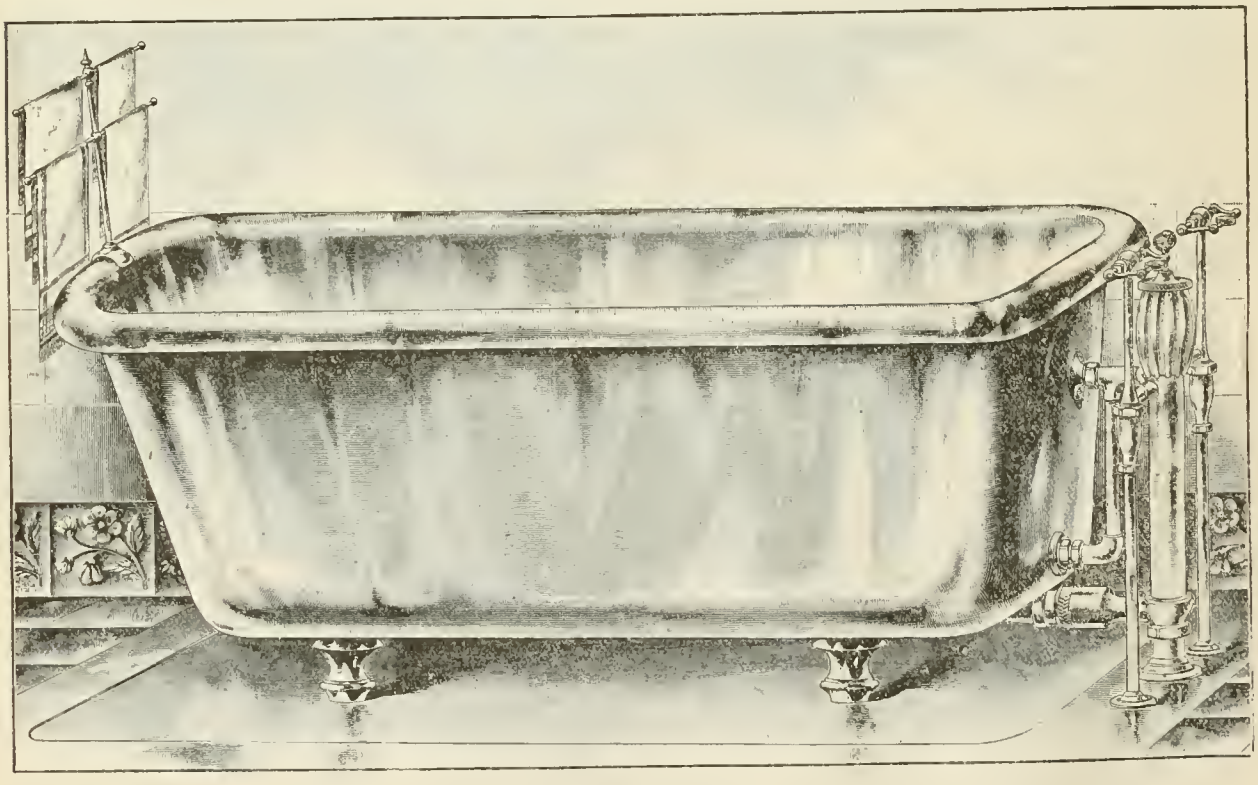
The Bourse Syphon Jet Closet.

Cooper's Aluminum Roll Rim Bath.

What is referred to as probably the largest casting ever made in aluminum is the bath recently introduced by the W. S. Cooper Brass Works of 444–448 North Thirteenth street, Philadelphia. After two years of experiments, the Cooper Company have succeeded in making a large casting for bath purposes. Aluminum is particularly suitable for baths, being light in weight and susceptible to a high degree of polish which will not tarnish easily. The metal is practically imperishable, and will neither corrode, discolor, crack, warp, split nor chip. A sink made of it has been in use by workmen at the Cooper factory for nearly two years, during which time it has been subjected to severe trials; but it remains uninjured and retains its original brightness. The bath, as shown in our illustration, is cast in one piece and has a 3-inch roll rim. The thickness of the metal is about $\frac{3}{8}$ inch. The outside length of the bath is 5 feet 10 inches, the outside width 2 feet $9\frac{1}{2}$ inches, and the outside depth 1 foot 10 inches. The weight, with feet, but exclusive of fixtures, is 145 pounds. The inside and outside surfaces are alike, highly polished. In shape the bath is handsome, and combines the good features of both Roman and French patterns.

The cost of aluminum at the present day necessarily makes such a bath a rather high priced article; in fact, as the makers say, "it is not a poor man's bath." And yet, we understand, the price exceeds but slightly the price of a porcelain bath, of which bath the aluminum is destined to become a rival. There is said to be less chilling effect on hot water and the person of the bather upon contact with the bath when an aluminum bath is used.

The bright appearance of the metal is permanent and no rubbing or polishing is necessary. The bath is unaffected by acids, alkalies or gases, and should water, after use, be allowed to remain in the bath over night, the metal is not affected at the surface of the standing water. The bath is practically indestructible and cannot be fractured under the most severe blows. One size of bath only is manufactured at present, but other sizes are in preparation and a full line will soon be ready for the market. The fixture shown in the illustration is the Protectus supply, waste and overflow combination, manufactured by the Cooper Company and now appearing on the market for the first time. The combination contains waste and overflow, with supply and waste pipes to floor and floor flanges; and improved mixing cock and an attaching bracket to which is connected a low down supply pipe. The mixing cock is operated by urn handles, governing the supply of hot and cold water. These handles, when supply is required, are simply pulled over toward the bathtub; and the movement reversed when a cut off is desired. Dials on the



Cooper's Aluminum Roll Rim Bath.

handles denote when the supply is open or closed. The supply nozzle and waste grate are made of aluminum, the remainder of the fittings being nickel plated all over. When desired, the fixtures can be placed at the back of the bath instead of the end.

The towel rack shown in the illustration is also a recent introduction of the Cooper Company. Such articles are usually attached to the wall of the bath room, but it will be noticed that this rack is designed for attachment to the rim of the bath at any point within reach of the bather.

The fixtures represent the very latest ideas in elegance and convenience and are fully in keeping with the magnificence of the bath.

TRAPS AND VENTS.

THE DEATH of James T. Maher of Taunton, Mass., removes a successful and respected plumber from his work. He learned his trade in Fall River, but had carried on business for a quarter of a century in Taunton, where his work is found in its most notable buildings. He was a member of a number of social and business organizations and a director of the Presbrey Stove Lining Company. His plumbing business will be carried on by his brother, John Maher.

A LOCAL PAPER of Malden, Mass., says: "Much of the plumbing about the city and especially in the older houses has been found on inspection to be defective and when the sewers are completed it will be found necessary to replumb those houses and it will be ordered done by the Board of Health."

A NEW PLUMBING shop is being erected for F. J Talbot on Greenwich avenue, Greenwich, Conn.

THE BOARD OF HEALTH of North Attleboro, Mass., have appointed J. Q. Hennigan, Joseph Lovell and the chairman of the board, as a Board of Examiners of Plumbers, as required by the State law.

THE PARTNERSHIP which has existed in the plumbing business between D. Crowley and Elmer Dustin, at Leavenworth, Kan., has been dissolved. Mr. Crowley will continue the business.

A SLIGHT FIRE at Fox & Rand's plumbing establishment, at Water and Gold streets, Bridgeport, Conn., was put out with chemicals Saturday morning. The fire started from a grate.

THE HANNIBAL PLUMBING COMPANY are preparing to remove to the Hubbard Building, 814 Broadway, Hannibal, Mo.

LESTER & THROWELL are to occupy a new building being erected at San Mateo, Cal., as a plumbing establishment.

THE PARTNERSHIP of the plumbing firm of Abdon & Schoerpf, at Fort Wayne, Ind., has been dissolved. G. Abdon has opened a shop at 12 Hoffman street.

THE ANNUAL MEETING of the Stradling Plumbing & Heating Company of Utica, N. Y., was held January 19, when the following directors were elected: E. W. Stradling, E. H. Bice, E. J. Stradling, J. J. Droz, A. H. Dobson. The following officers were chosen: President, E. W. Stradling; vice-president, E. H. Bice; secretary, E. J. Stradling; treasurer, A. H. Dobson.

THE PLUMBERS' UNION of Paterson, N. J., has recommended to Mayor Braun to appoint John Campbell, one of its members, who is an experienced sanitary plumber, on the Paterson Board of Health. The recommendation was indorsed by the Passaic Tradea Assembly.

R. & J. ROBERTSON, the plumbers, have begun work on the R. R. Endicott mansion, on Broadway, Beverly, Mass.

THE PITTSBURGH BRASS COMPANY, Pittsburgh, Pa., went into the hands of a receiver on January 21, on a bill filed by a Canadian stockholder. The bill states that the company, by reason of a large increase in their business, were compelled to make extensive improvements entailing heavy expenditures. The business depression coming on, however, caused a decrease in orders; consequently payments due for the work could not be made. The application for a receiver was made in order to prevent a waste of assets, which are said to be more than twice the amount of the concern's liabilities, being estimated at $400,000, as against $175,000 debts. Joseph McNaugher of Allegheny was appointed receiver. The company are reported to be excellent shape and their obligations will be met as they fall due. A reorganization will, it is believed, soon take place.

THROUGH the kindness of Alexander Don, 187 Washington avenue, Newark, N. J., we receive the list of officers elected for the ensuing year by the Master Plumbers' Association of Newark, N. J. They are: President, Elias Berla; vice-president, Chas. E. Bond; recording secretary, Alexander Don; financial secretary, Wm. Jacobi; treasurer, Jos. A. Smith; sergeant-at-arms, E. G. Leonard; trustees, Ira Budd, Wm. Demars and T. Geiser. Mr. Don says: "Our association is getting stronger every meeting, and we expect to become members of the National Association in a very short time."

THE STATE BOARD OF PLUMBING EXAMINERS, at Denver, Col., has issued plumbing certificates to the following: First-class certificates, R. J. Cathart, J. M. Dillon, J. H. Winter, Andrew Morrison, H. M. Graves, John Wild, S. G. Smith, Charles Fullman and G. H. Darrow. Master plumbers' certificates were issued to W. P. Fraker and H. M. Luce. Certificates of the second class were issued to the following journeymen: C. E. Boltz, B. B. Kinkade, Thomas Fairhurst, A. J. Pierce, D R Jones, W. F. Davis, J. L. Webster, S. S. Wessells, G H. Halley, M. L. O'Malia, H. W. McGee, W. Heathcote, E. E. Hebert, Fred. Tost, P. J. Ralph, M. Creek, W. M. Ecker, E. B. Clayton, George Barry, James Costello, M. M. Krentz, C. B. Price and H. W. Boot.

AT THE ANNUAL MEETING of the Master Plumbers' Association of Bridgeport, Conn., the following officers were elected: Thomas Logan, president; C. S. Eames, first vice-president; George E. Scofield, second vice-president; C. S. Eames, recording secretary; L. H. Mills, treasurer; Alfred Hopkins, Henry Middlebrook and James Cook, trustees. The association will meet February 9 to complete arrangements to attend the meeting of the State association at Hartford February 15, when Zalmon Goodsell will read a paper.

C. D. RODGERS has purchased the plumbing establishment of John Dyke, of Mexico, Mo.

JAMES H DOYLE, a well known plumber of St. Paul, Minn., has opened a plumbing shop at 207 Plum street, Red Wing, Minn.

THE PLUMBING FIRM of Fallon & Barry, 1 Park street, Charlestown, Mass., has been succeeded by Joseph H. Barry, who will continue the business at the old stand.

THE SHUSTER FOUNDRY COMPANY of Philadelphia have issued to their friends in the plumbing trade a "Plumbers' Vest Pocket Health Office Register." This register fills admirably the wants of plumbers in the way of a handy record keeper of the plan numbers of work in the different wards of a city, the dates of filing of plans, of applications for inspections and of applications for final inspections. The register contains about 32 pages of heavy ledger paper, with wide blue rulings, red column rulings and printed column headings. It also contains a complete price-list of the soil pipe and fittings made at the Shuster foundry. It is bound in celluloid covers, with leather back and edges, and is of a shape and size convenient for the vest pocket. The front cover carries the title of the book and a cut of one of the Shuster Sure Seal specialties, with the name and address of the company. A similar book was issued by the concern in 1890, and judging from the appreciation it found at the hands of the plumbers the issue of 1894 will be welcomed. Comparison of the price-list in the 1890 book with that in the new edition will to an extent show the advance of the company in the sanitary fittings business and demonstrate their ability to supply anything in the way of an iron fitting or pipe.

AN ASSOCIATION OF MASTER PLUMBERS was organized at Memphis, Tenn., January 20, and the officers elected are: President, John Hopkins; vice-president, J. J. Bailey; secretary and treasurer, E. McGowan; sergeant at-arms, Martin Woods. This association is a member of the National Association.

A. S. PERCIVAL is president and J. L Phillips secretary of the recently organized association of master plumbers, at Waltham, Mass.

VICE PRESIDENT DEEDY of the Massachusetts State Association of Master Plumbers has called a meeting of the plumbers of Malden, Medford, Melrose and Everett, to be held at the Evelyn House, Malden, at 3 p.m., January 30, for the purpose of organizing a local association. This movement is largely due to the personal efforts of B. O. Tilden. On February 1 the same officer will meet the plumbers of Newton and vicinity in the Foresters' Hall, at Newton, at 2 p.m., for the same purpose. National President Daniel G Finnerty and Secretary David Smith will be present at both meetings.

THE MASTER PLUMBERS of Salem, Mass., are considering the organization of a local association and joining the National Association of Master Plumbers.

EMILE WILLSTETTER is building a one-story frame plumbing shop, 18 x 9 feet, in the rear of 288 Orange street, Newark, N. J.

THE PLUMBING FIRM of Ellithorpe, Johnson & Joyce of Niagara Falls, N. Y., has been dissolved.

NO BANQUET was served at the installation of the newly elected officers of the Master Plumbers' Association of Milwaukee, as it was decided to use the money for the benefit of the unemployed in that city. In the course of the evening the retiring president, F.

W. Pripps, made an address recounting the work of the year, the entertainment of the National Association and the wide benefits that result from it.

Peck Bros. & Co., 259 Wabash avenue, Chicago, report a general improvement in business. This is true of the city, where, however, many specifications will be held until there is a greater feeling of confidence in the money market. The surrounding country is sending in a larger number of orders and they look for a fair spring business, larger than could have been expected a month ago. There is also a steady growth in the demand for a better line of plumbing goods.

The Board of Health of Salem, Mass., at a recent meeting, elected John H. Chambers as inspector of plumbing, with a salary of $900 per year.

The Chicago Master Plumbers.

The Chicago master plumbers held a large and enthusiastic meeting at their rooms, 197 Madison street, Monday evening, January 22. President Paul Redieske occupied the chair. The reason for this great gathering was that all were interested in the success of the coming entertainment and ball, which is to take place at the Auditorium, Monday evening, February 5. The association intends to outvie its old-time glory in entertainments. For those who cannot "trip the light fantistic," literary and musical selections will be given between the dances by artists of high renown. The following committees of arrangements were appointed: Floor Committee, Thomas Conway, James H. DeViney, C. J. Herbert, M. Mandable, A. C. Hickey, W. H. Cummins, John G. Roland, Richard Finn, J. A. Voltz, Wm. Gay, Wm. T. Gary; Reception Committee, Robert Griffith, David Whiteford, A. Young, D J. Rock, E. Baggott, C. J. Boyd, J. R. Alcock, Alex. Irons, James H. Roche, J. G. Webber, T. C. Boyd.

We have received from the *American Artisan*, Chicago, the "Tinsmiths' Pattern Manual," by Joseph K. Little, C.E. This book is apparently a photo-engraved reproduction, page by page, of the first two parts of an English book by Millis entitled "Metal Plate Work." It is reproduced with no word of credit to Mr. Millis, and is even copyrighted in the name of the appropriator.

Among the novelties of a local nature at the Midwinter Fair, at San Francisco, are a miners' camp of 49 men, a gold mine, into which visitors can descend, and a Pacific deep diver and shark hunter. The exhibits of the mineral and agricultural wealth of California are said to be on a very imposing scale.

Warning is given that a considerable quantity of counterfeit money has been put in circulation recently in the Eastern States, consisting of quarter and half dollars, bearing date 1893.

A British statistician has published an elaborate series of calculations which prove that the losses to the United Kingdom, attributable directly or indirectly to the great coal strike of last year, reached by the most conservative estimates the enormous total of $155,509,832.

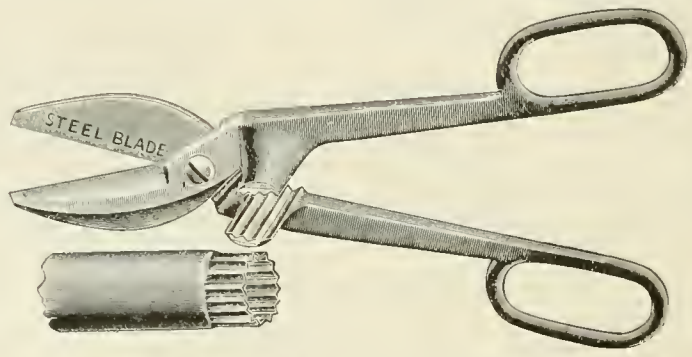
OBITUARY.

JOHN DEMING.

The death of John Deming occurred at his home in Salem, Ohio, on the 10th inst. Mr. Deming died of pneumonia after an illness of one week. He had nearly reached the age 77 years, having been born in Berlin, Conn., February 21, 1817. When about 15 years old he went to Ashtabula County, Ohio, with his parents, where they settled down. After reaching his majority Mr. Deming engaged in business with his older brother, William S. Deming, in a general store, at New Lyme, Ashtabula County. On October 25, 1849, he married Miss Angelina S. Bown, daughter of Benjamin E Bown, of Pittsburgh, with whom he was for a time associated in the wholesale and retail grocery business in that city. In 1850 Mr. Deming removed to Salem, where he engaged in farming for about six years, after which he entered the grocery business again for a period of three or four years. In 1859 Mr. Deming and his father-in-law, Mr. Bown, removed to Cincinnati, where they engaged in the manufacture of confectionery and importation of foreign fruits, nuts, &c. He continued in this business until 1864, from which time until 1868 he was identified with the pottery trade. In 1866 he bought an interest in the business of Dole & Silver, manufacturers of labor saving tools. The firm became Dole, Silver & Deming, and largely increased its facilities. Upon the death of Mr. Dole the firm name was changed to Silver & Deming, and continued under this style until 1874, when the business was incorporated under the name of the Silver & Deming Mfg. Company, with enlarged facilities and more varied output. Mr. Deming was for many years vice-president and treasurer of this company. The manufacture of pumps and hydraulic machinery was commenced in 1880. In 1890 the corporate title was changed to the Deming Company, which continued the pump and hydraulic machinery part of the business. Mr. Deming became president of the company, an office which he filled until his death. His two sons, Walter F. and William L., are also officers of the company and actively engaged in its management. In his earlier years Mr. Deming was prominently identified with the anti-slavery movement in his section and was a follower of William Lloyd Garrison, founder of the Garrisonian anti-slavery party, and for several years faithfully observed its principles in refusing to vote. He was an earnest advocate of temperance and a warm friend of the cause of education. Many tributes are paid to his worth, indicating the esteem in which he was held.

The Columbia Combined Snip and Crimper.

Below we present a new tool for tinners, invented by H. W. Smith, who gained fame previously by adding many good ideas to the trade, one of which is his steel roof, manufactured by the Canton Steel Roofing Company, Canton, Ohio. This combined snip and crimper is manufactured by Ruth, Patterson & Ruth of Alliance, Ohio, who claim it to be a practical tool for making a complete joint in metal pipe, and it will find favor among tinners generally, for it obviates the "nick" or bending the pipe out of shape, and saves the snips from being sprung, as is liable to occur when crimped by the blades in the old way. The figure represents the combined tool. The crimping device is made to the snip directly back of the pivoted blades, with three teeth tapering to the end of the crimper so as to make a gradual crimp in the pipe. Its location gives sufficient leverage for easily making a perfect crimp, it is said, in sheet metal as heavy as No 24 iron. The handles are made straigh so that the snip can be reversed and the crimper will not interfere in cutting in corners, &c. The size is No. 8 of the regular tinners' snip.



The Columbia Combined Snip and Crimper.

Barring the coldness of its climate, Vermont seems to be the place to live in these hard times. Ex Governor Stewart announces that there are no tramps, few out of employment and little or no destitution in the State up to date.

The greatest novelty in iron alloys is that with molybdenum, which metal, according to Sterrberg and Deutsch, may be readily obtained by reducing calcium molybdate with carbon. The metal, when cleared from slag by hydrochloric acid, contains from 96 to 98 per cent. of molybdenum, and can be supplied at about $1.25 per pound. The effect on steel is similar to that of tungsten; but as both the atomic weight and specific gravity are only about one half of those of the latter (W 184, sp. gr. 19; Mo. 96, sp. gr. 9), a very much smaller addition is required to obtain the special self hardening property. Steel containing 2 per cent. of molybdenum is said to be silvery white, with a fine silky fracture, and extremely hard.

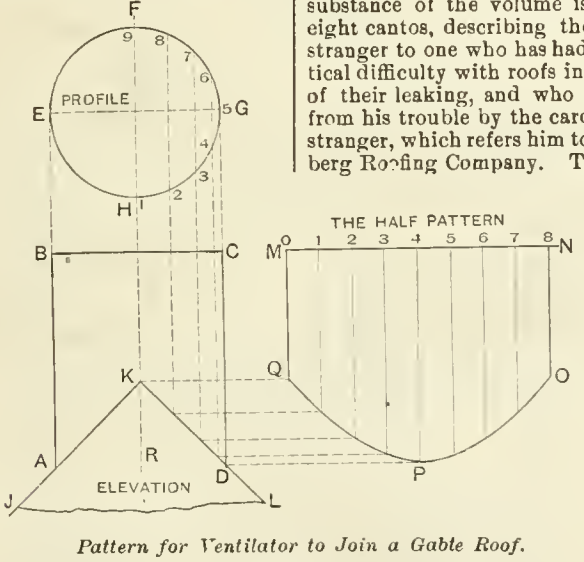
As an illustration of the growing importance of the telephone as a means of communication it is noted that the business of Louisville, Ky., was recently impeded to a serious extent by the destruction of the telephone exchange in that city, when the switch board with 3000 wires was burnt out.

ROOFING AND CORNICE.

Pattern for a Ventilator to Join a Gable Roof.

From J. H. W., *Providence, R. I.*—How is the pattern for a round ventilating pipe to be obtained, the pipe to set over the ridge of a gable roof ?

Answer.—In the accompanying diagram let A B C D represent the round pipe that is to set on the ridge of roof, as shown by J K L. In line with the sides of the pipe draw a profile, as shown by E F G H, and through the center draw F R. As the two sides of the roof, J K and K L, are of the same inclination, and as the center of the pipe is over the ridge K, both halves of the pattern



Pattern for Ventilator to Join a Gable Roof.

will be alike. Accordingly the half pattern only is shown. Then, to obtain the part of pattern shown, proceed as follows : Divide H G F of profile into any convenient number of equal parts, as indicated by the small figures. From the points thus obtained in H G F drop lines parallel with the center line R F, cutting K D of elevation. On B C extended, as M N, lay off a stretchout of H G F, through the points in which draw the usual measuring lines. Commence numbering the lines at the point where the joint is to be, in the present instance at H. Place the T-square parallel with the stretchout line M N, and, bringing it against the points in the line K D, cut the corresponding measuring lines. A line traced through these points of intersection, as shown by Q P O, will form the required part of pattern. The other half of the pattern can be obtained by a repetition of the above process, or by duplication.

THOMAS LEE GALVANIZED IRON WORKS, 79-81 Race street, Cincinnati, Ohio, report business in their line quite satisfactory, they having the sheet metal work for a number of large buildings under way and some completed awaiting the finishing up of other parts.

FLASHINGS.

A NOVEL ADVERTISING BROCHURE is published by the Kanneberg Roofing Company, Canton, Ohio. It is a neat little pamphlet of fine white paper entitled "The Stranger." The first thing that strikes the reader is the curious emblem within the front cover, looking remarkably like some old Greek coin, and only when the reader has got to the end of the book does he discover that it is merely "The Superior Steel Roofing" spelled backward, in a rather antique style of lettering. The substance of the volume is a ballad of eight cantos, describing the visit of a stranger to one who has had much practical difficulty with roofs in the matter of their leaking, and who is delivered from his trouble by the card left by the stranger, which refers him to the Kanneberg Roofing Company. The drawings are excellently done, and show the advance from distress to resignation, then interest, and finally great content, as the possibility of a tight roof is realized. In addition the Kanneberg Roofing Company also supply eave troughs, conductor pipes, ar anything in that line.

THE FIRM of Caswell & Moore, Phœnixville, Pa., will place the roof on the Citizens' Traction Company's new power house, located on Beech street, Philadelphia. The roof, which is a large one, will be constructed of corrugated iron.

THE D. K. MARTIN ROOFING & MFG. COMPANY of New York City have been incorporated, with a capital of $100,000. The directors are: D. K. Martin and E. T. Dehan of New York, and J. L Goodenough of Whitestone, L I.

THE MCDANIEL & HARVEY COMPANY of Philadelphia, sheet iron manufacturers, have recently installed a complete modern plant for making painted and corrugated iron sheets, curved sheets and standing seam and roll and cap roofing. The plates will be rolled in their own mills and the manufacture completed in their own works. They will continue to make galvanized steel sheets and their "genuine old fashioned charcoal bloom galvanized iron sheets," Eagle brand.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until February 14 for the wood roof, sheathing, slate and copper work of roofs, the steel, iron and slate and copper work on dormers, down and drain pipes. &c., on the United States Post Office and Court House Building, at Detroit, Mich. Drawings and specifications can be had at the office of the Supervising Architect, Washington, or from the superintendent at Detroit.

THE NINTH ANNUAL MEETING of the Metallic Roofing Company of Toronto, Limited, was held at the head office in Toronto, Ontario, on the 15th inst., when E. Samuel was re-elected president, A. D. Benjamin vice president, and J. O Thorn secretary and treasurer.

Unemployed Workmen.

The advantage, during such hard times as those with which the United States and England have recently been visited, of being a skilled workman, is well brought out in the following remarks by "Vulcan" in the London *Ironmonger:* We hear a good deal about the unemployed just now, but it seems an equally common experience that competent mechanics are exceedingly scarce. It must be, I suppose, although some deny it, that the unskilled workers form the vast majority of that class to which public attention is directed. In a Western town not long since an ironmonger advertised for a light porter, and before 10 o'clock in the morning scores of applicants presented themselves. A few weeks later the same firm advertised for a mechanic, and offered the full standard wage; but, although the announcement appeared in several papers, and in some of them more than once, yet only three applications were received in all It is to be hoped that the present generation of parents will be more alive to the importance of having their boys taught a trade than their immediate forefathers were.

At a meeting of the Executive Committee of the Brass Workers' National Trade Assembly, held in New York on January 21, it was reported that the trade generally was in excellent condition, and that every member of the assembly had enough and to spare for his family. The number of local unions was reported to be increasing.

While the year 1892 was one of disturbance and disaster in so many countries, it appears to have smiled on Ireland. The London *Times* says that last year was one of the most peaceful and prosperous of the century in the Emerald Isle. Since 1826 there has been no better agricultural season, and the people have never been freer from distress.

STEAM AND HOT WATER.

Horse-Power and Heating Capacity.

From W. A. C., *Paterson, N. J.*—Will *The Metal Worker* please give me some information on the following subject: What horse-power horizontal tubular boiler will be required to heat a school house which has 10,000 feet of radiating surface in coils? How many feet will a one horse-power boiler heat? Please let me know how to find the horse-power of a horizontal tubular boiler?

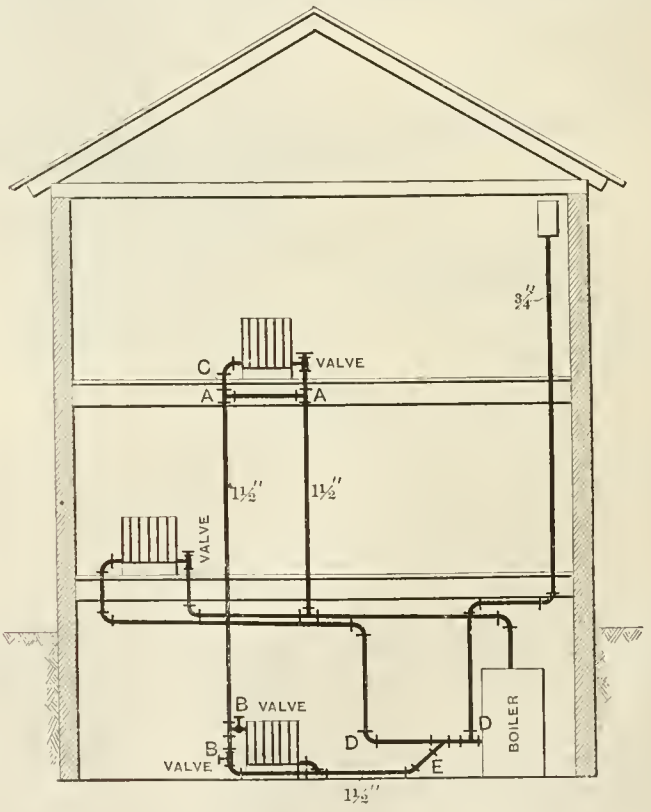
Answer.—In the Letter Box of October 14 our correspondent will find some information on the same subject. Authorities vary in stating the horse-power of heating boilers, but an average of the different authorities gives 16 feet of boiler surface as equal to one horse-power when used as a heating boiler. These same authorities vary equally in giving the amount of radiating surface that one foot of boiler surface will supply, but a conservative number is about five feet. By dividing 10,000 feet of coil surface by 5 our correspondent will find that he will require 2000 feet of boiler surface, and by dividing the 2000 feet by 16, he will find that a 125 horse-power boiler will be required to heat the building. Assuming that there are 16 feet of surface to a horse-power and each foot of surface in the boiler will heat five feet of radiating surface, a one horse power boiler would heat 80 feet of radiating surface, but this is probably incorrect for a single horse-power boiler, but intended for use as a rule where the boiler has several horse-power.

Radiator on Boiler Level.

From A. C. EDGAR, *Philadelphia.*—Different methods are used by different men for connecting radiators on the same level as the boiler in a hot water heating system. Some advocate the independent flow main to supply such radiators; others claim the syphon can be used with better results, while one ventures to recommend an opening from flow main direct to top of radiator. It is true that each of the above methods can be used with success, but it cannot be said that all will give satisfaction under all conditions. When the independent flow main is used the outlet should be taken direct from the boiler. This is not always convenient when the radiators to be supplied are any great distance from the boiler, and when finished partitions are encountered requires extra cutting. The syphon also requires extra cutting, and when exposed in parlors or sitting rooms is no ornament. Supplying the radiator direct from the flow main gives very poor satisfaction, and if taken from the main near an outlet for riser to floors above, will not circulate properly, although the radiator may become partially warm from conduction or local circulation.

The accompanying sketch shows a method of connecting radiators on the same level as boiler that has been used with good results. The radiator above should always be tapped one size larger than for ordinary connections. Under the floor at A A connect flow and return, forming a syphon. Valves B B are connected in by-pass at lower radiator, which allows either radiator to be operated without interfering with the other. This method embraces the best features of the syphon without requiring any extra rising lines or air pipe, as well as overcoming the objectionable feature of supplying the lower radiator with the return from the upper one in the ordinary way. The flow and return risers, being larger than usual, deliver more hot water than the upper radiator requires, thus promoting the circulation in the lower radiator and maintaining almost the same temperature in both. It is not advisable to reduce the run of the tee under the floor, for when the upper radiator is in use, the water not allowed to pass through it, being warmer, will retard the circulation when it comes in contact with the return at C.

While there are many methods of connecting radiators on the same level as the boiler, some give better results than others. When the above method is properly connected it will always give good results. The flow connection is not all that is necessary to induce circulation; it is very important that the return connection be made at the proper place. The lower radiator will not circulate properly if the return from it is connected into the bottom of a tee that is bullheaded to the boiler, nor is it proper to connect the return into the outlet of a tee on the horizontal main return. When a Y is connected between points D D, as shown at E, the circulation in main return will assist the lower one.



Radiator on Boiler Level.

HEATING NOTES.

BELKNAP MFG. COMPANY, Bridgeport, Conn., manufacturers of steam fitters' supplies, have recently added to their plant, put in new machinery and taken advantage of the dull season to overhaul the entire factory in preparation for the spring trade. The changes are in the direction of economical production and greater capacity all around.

BROOMELL, SCHMIDT & CO., LIMITED, York, Pa., have opened a branch in Philadelphia, with office and wareroom at 146 North Third street. Fred. Ruof, who has had much experience in the heating line, will be manager, and A. P. Broomell of the firm will also be at the Philadelphia office a good deal of the time. The firm will do a general contracting business in steam and hot water heating, steam fitting, &c., and will carry in stock a line of Our Own radiators, Keystone boilers, horizontal tubular boilers, steam pumps, steam traps and other specialties. The Heat-

encook range will also be handled and pushed on the Philadelphia market. The store and office will be heated from one of these ranges, which will be set up and operated.

THE STOCKHOLDERS of the American Boiler Company held their annual meeting at the offices in Chicago on the 17th inst. The following directors were elected for the ensuing year: William K. Pierce, Henry T. Richardson, George E. Downe, A P. Richardson, M. T. Pierce and C. V. Kellogg. At a subsequent meeting of the directors the following officers were elected: President, William K. Pierce; vice-president. Henry T. Richardson; secretary, A. P. Richardson; treasurer, C. V. Kellogg. It will be seen that George S. Downe has retired from the vice-presidency. Henry S. Downe remains with the company as salesman, having his headquarters in Chicago. A report has been in circulation for some little time that at this meeting steps would be taken to dissolve the company, but we are advised by the officers that no such action occurred or was contemplated. All interests continue, and the policy of the company will be the same as heretofore. The management of branch offices, as far as known, will remain in the same hands.

VICE PRESIDENT A. T. HENDERSON and Treasurer H. A. Smith have purchased all the capital stock of the United States Heater Company, and will issue $25,000, additional stock, which has been subscribed for. The office of the company, at 113 Randolph street, Detroit, will be continued, and an office will be maintained in Chicago for the transaction of business connected with the territory west of Chicago. The company have secured the showroom at 100 Lake street occupied by John W. Mills, who is to discontinue the contracting department of the business, and will be connected with the management of the United States Heater Company, assisted by D. E. McCabe. Arrangements are being made by the company for the manufacture of larger sizes of the Capital and Hecla heaters, also for a line of small boilers for steam and hot water. These new sizes of heaters and boilers are expected to be on the market during March or April.

WE ARE INDEBTED to Secretary Reynolds of the Master Steam and Hot Water Fitters' Association of the United States, with office at 625 Metropolitan Life Building, Madison avenue and Twenty-third street, New York, for a neat little pamphlet containing the constitution and by-laws of the Master Steam and Hot Water Fitters' Association of the United States. The list of officers since the inauguration of the association, in 1889, up to the present time is also printed.

AT THE ANNUAL MEETING of the Kewanee Boiler Company, Kewanee, Ill., the following directors were elected: E. E. Baker, Horton Vail, J. P. Dugger, B. F. Baker, August Wagner and T. P. Pierce. The directors then chose officers as follows: President, E. E. Baker, vice-president, Horton Vail; secretary, J. P. Dugger; treasurer, B. F. Baker.

A CIRCULAR ISSUED by H. Andres, 403 Market street, Philadelphia, Pa., the Eastern agent for the Ware Automatic Heat Generator & Regulator Company of Chicago, Ill., presents a broken view of the Ware heat generator with explanatory text showing its operation. The apparatus is furthermore described in the inner pages of the circular and attention is likewise directed to the Ware automatic fuel controller.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THE PROPERTY COMMITTEE of the Lancaster School Board recently adopted for the new school building at East Chestnut and Franklin streets, Lancaster, Pa., the Fuller & Warren heating and ventilating system.

THE CONTRACT for the plumbing of the new Young Men's Christian Association Building, at McKeesport, Pa., has been awarded to R. B. Beane of Walnut street. The price is said to be about $900.

A NEW SYSTEM OF VENTILATION is to be provided in the city hospital at Cincinnati. It is to be an exhaust fan system and bids will soon be asked for the fans and air ducts and the remodeling of the heating plant to conform to the new requirements. It is expected that the expense will reach $5000.

YARRINGTON & MCCABE, Birmingham, Conn., have secured the contract for the plumbing on Perry's new tenement house in Shelton.

THE CONTRACT for the plumbing in Swarthmore Hall Building, at Swarthmore, Pa., has been awarded to Manning Bros. of Morton, Pa.

WILLIAM A. HECKMAN, plumber, 18 North Eighth street, Reading, Pa., received the contract for the plumbing work at the new Felix Seminary in Muhlenberg township. The water supply will be from two tanks on the third floor, each holding 1000 gallons of water, which are kept filled by a hot air pump. Mr. Heckman will also install a heating plant on the Mercer hot water heating system.

WM. WENZEL, Appleton, Wis., has been awarded the contract for plumbing in Geo. Danielson's store in Neenah, also in the Kimberly Clark Co.'s offices.

J. F. STEPHENSON, Lakewood, N. J., has recently completed the installation of a hot water heating plant, using a Novelty Circulator, in the Lakewood residence of S. B. Ferris of Newark, and a combination plant of hot air and hot water, using six registers and 13 radiators, in a house to be occupied by Geo. J. Gould of New York, using an Ideal Novelty furnace.

THE LAWRENCE PLUMBING & HEATING COMPANY, Lawrence, Kan., have the contract for the plumbing in the new University library, amounting to about $1100.

THE COMMON SENSE HEATING & VENTILATING COMPANY were awarded the contract for heating and ventilating the new hospital at Dallas, Texas.

DELL CROSS is doing the plumbing at the European Hotel, Renovo, Pa Bathtubs, water closets, &c., are among the improvements to be installed.

PROPOSALS are asked for the plumbing for the Plain street school, at Clinton, Mass.

SHAW, KENDALL & Co. of Toledo, Ohio, have been awarded the contract for installing the heating plant in the new National Union building on Huron street of that city. The Plenum system will be used and the air will be drawn from a point higher than the building into the large fans which will drive the air over steam heated pipes through a series of air passages into all the rooms in the building. The auditorium in the building will be heated by warm air issuing from over 200 small openings directly beneath the chairs. The fans are to be operated in summer to bring in fresh air and cool the building.

R. & J. ROBERTSON, Beverly, Mass., are doing the plumbing and hot water heating of Dr. G. A. Webber's residence at Manchester, Mass. In this house they will use a 304 Gurney hot water boiler and 12 radiators. They have taken the agency for the Gurney hot water heaters.

P. J. SWEENEY & Co. of Lawrence, Mass., have been awarded the contract for the steam and water pipe fitting of the Consumers' Brewing Company's large new building at Lowell.

THE WALCOTT-HURLBUT COMPANY, 175–177 Lake street, Chicago, have received an order from the school board at La Salle, Ill., for four "eduction" closet ranges, comprising 28 sections in all.

B. J. BUSH, Chicago, intends building a three story apartment house, 42 x 72 feet, to cost $12,000, that will be heated by steam.

THE CONTRACT for plumbing the opera house, at Faribault, Minn., has been let to Clefton Bros. & Conner of Minneapolis.

British Tin Plate Works.

The following extract from a recent issue of the *Mechanical World* of Manchester, England, affords some information in regard to British tin plate works, which is of interest: From a recent official report it appears that there are at the present time 96 tin plate works in England and Wales, with a total of 519 mills. These produce, on an average of recent years, some 450,000 tons of tin plates per annum, so that the average output per mill is nearly 5000 tons. But as there is always a certain proportion of the mills out of work, and as many others are on slack time, there must be a much larger production than this possible to the best mills that are regularly employed. The principal center of the tin plate trade is Swansea, where there are 51 different works, with a total of 276 mills. Swansea is also the chief tin plate exporting center in the kingdom. Between 1877 and 1892 the exports of tin plate from that port advanced from about 11,000 to 252,000 tons. It is estimated that there are altogether 140 works, of 36 different descriptions, within a radius of 4 miles of Swansea harbor, and that these various works employ a total of some 30,000 people. It may be added that the Harbor Commissioners of Swansea propose to expend a considerable sum of money in providing additional dock and harbor facilities, and although trade prospects are just now not of the brightest, it is likely that the suggested improvement will be carried out shortly, in anticipation of the long looked for revival of activity.

A Southern industrial journal announces the discovery of a rich vein of tin ore at a depth of 10 feet below ground, at King's Mountain, N. C.

An important find of good coal is reported in Mendocino County, Cal., where mines are about to be developed.

THE RETAIL STORE.

Retail Dealers' Convention.

A meeting of the stove dealers of Oswego County was held at Central Square, New York, on Saturday, January 13, for the purpose of discussing questions of interest pertaining to the stove and hardware trades. The originator of the movement was Dayton R. Fritts, a dealer in stoves and hardware at Parish, N. Y. As a result of this meeting, a permanent organization of stove dealers was formed, with George Elliot of Central Square, president, and George Douglas of Pulaski, secretary. A committee was appointed to draft by-laws and consider other matters of importance in this connection. We understand that the association is to meet twice a year at some convenient point in the county, and that more permanent arrangements are likely to be made at the next meeting. After the business in question had been transacted the meeting adjourned, subject to the call of the president. Among those present may be mentioned the following: J. P. Ford, Lacona; L. J. Macy, George Douglas, Pulaski; Dayton R. Fritts, Parish; George Elliot, P. L. Lane, Central Square; N. A. Hughes, Phœnix; A. J. Wright, George Johnson, Mr. Loomis of Loomis & Wilson, Fulton; Mr. Penfield of Quigg & Penfield, Mr. Dowd of Oswego Hardware Company, Oswego; Ed. Stone of B. S. Stone & Co., Mexico, and F. Jennings, Sand Bank.

Enterprise Coffee, Spice and Drug Mill.

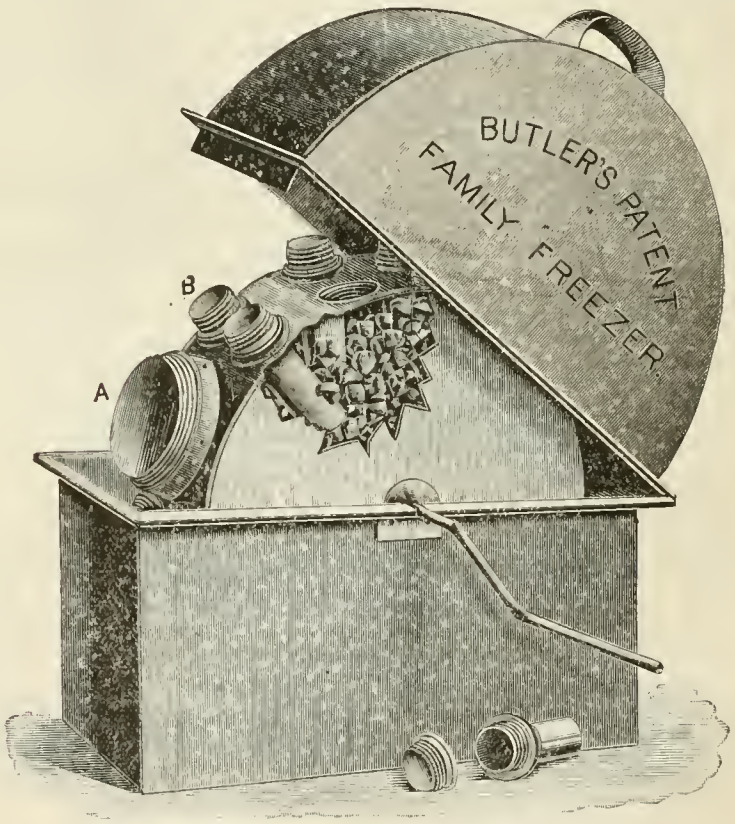
The Enterprise Mfg. Company, Philadelphia, Pa., are introducing the mill here shown. It is 16⅝ inches long, cup included, 7½ inches wide, 6⅞ inches deep, and weighs, complete, 17 pounds. It is designed to attach to a post or

Enterprise Coffee, Spice and Drug Mill.

wall and is readily detached when desired. The mill is designed to meet the demand for a mill of large size for use in hotels, lumber camps, boarding houses, on steamboats and for other places where economy in space is requisite. The makers state that for power and speed, the degree of fineness of grinding being the same, it is equal to their No. 5 mill, but, should finer grinding be desired, that it equals in all respects their pulverizers from Nos. 00 to 4 inclusive. The mill is handsomely japanned, ornamental in appearance and will be known as No. 350.

Family Ice Cream Freezer.

T. G. Ellsworth, 85 Chambers street, as sales agent, is introducing the Butler-Kattenhorn & Ellsworth family ice cream freezer, as illustrated herewith. The freezer is constructed entirely of metal, the outside case and cover being of galvanized iron. The revolving drum is provided with holes having threaded



Family Ice Cream Freezer.

flanges, which project into the drum and form sockets, into which the threaded portions of the cream cups B fit. The cups are provided with covers, so as to hermetically seal them, preventing the brine from coming in contact with the cream. A cup and cover is shown outside the case, near the bottom of the cut. The cups, as regularly made, are designed to hold a suitable quantity of cream to serve to an individual, or they may be made any desired size. The freezer shown contains 22 cream cups, arranged in such a way, it is stated, as to be readily placed in the drum or removed from it. For filling the drum the cap A is removed and the drum is filled with ice and salt, and the cap screwed back again to its water tight position. A pulley is placed upon the larger machines when power is required to drive them. The freezer is designed for freezing individual creams, ices, custards, &c., and the point is made that as many different kinds may be frozen at once as there are cream cups, or that all the cups may be used for one kind.

The E. S. Farson Mfg. Company of Philadelphia have issued their annual catalogue of Farson refrigerators and water coolers. In the line of improvement they have introduced overlapping doors on all their styles of refrigerators; also improved surface locks and sliding doors for covering concealed spigots. All zinc linings in their goods are turned under, thus leaving no rough projections. As a novelty for this season they illustrate the Farson hardwood buffet refrigerator, made in walnut or oak. This article is claimed to be especially suitable for clubrooms and dining rooms, combining as it does both refrigerator and sideboard, and rendering a separate sideboard entirely unnecessary. The tank is porcelain lined, and has a capacity for 72 pounds of ice. There are two large compartments in the refrigerator, and a small one 6½ inches high and 20 inches wide, the latter situated directly below the tank and separate from the other compartments. The water spigot is ingeniously concealed, and there is no drip pipe. In design the refrigerator is handsome, and when closed has the appearance of an ordinary buffet.

Delivery of Goods.

BY H. P. KING.

A system for delivering goods, like other branches of the business, must necessarily vary with the volume of trade and the population of the city. The following suggestions are based on the supposition of a city having from 70,000 to 80,000 inhabitants, a retail store catering to household as well as builders' trade, and the employment of one delivery wagon which is never called into the service of the shipping clerk.

A COMPLETE LIST.

The first requisite in the disposition of goods sold, is to make a complete list, showing every article which the purchaser has selected and the quantities of each. After the list is called back and checked, the goods that can be wrapped and tied in packages should be cared for at once, to avoid all possibility of being mislaid by casual and careless passers by.

MARKING PACKAGES.

For marking packages a gummed tag is the surest method of avoiding errors in delivery; for bulky goods a string tag or paint, as the case may require. If but one package or article is to be delivered, mark name and address on the tag, but if packages are numerous, mark name only on all tags except one and on that one the name, address, number of packages and list of articles not wrapped.

A CHECK ON THE SALESMAN.

By the enumeration of packages and articles in the duplicate receipt book of the delivery wagon the driver has a check on the salesman and can be reasonably sure of starting right at least. As to the disposition of goods awaiting delivery a counter or floor space devoted to this sole purpose is very necessary. Where it is not practicable to gather all the goods in one space the delivery clerk can ascertain from the before mentioned tag just what goods are to be delivered and go to the different floors or rooms to find them.

DELIVERY WAGON.

The most effective and satisfactory use of the delivery wagon is found in the division of the city into districts and making a trip to each district at stated hours. By this system, if adhered to, a customer can be given definite information as to the time the goods will be received. In case of immediate delivery being required various methods may be followed, according to the circumstances. If the goods are in a small, light package, the office boy or messenger service can be utilized; if goods are bulky then an expressman must be hired and the expense charged to the customer or not—according to the discretion of the salesman. Under no circumstances should the hours and trips of the delivery wagon be interfered with.

DUPLICATE RECEIPT.

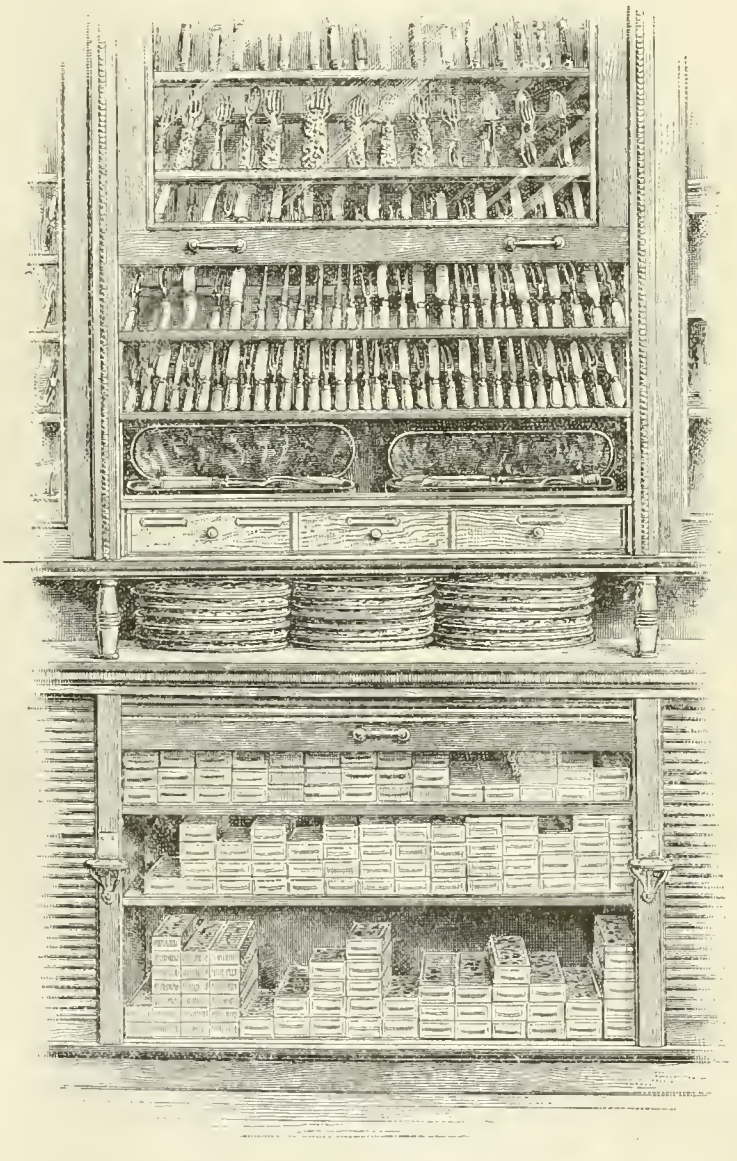
The goods having reached their destination the duplicate receipt is given with them, and the book signed after a careful counting by the party to whom they are delivered. No inspection of packages is practicable, for too much time is consumed and the error in the contents, if any, can only be rectified at the store, and the delivery clerk has his time schedule to keep up.

COMPLAINTS OF SHORTAGE.

Instances are very numerous of contractors making complaints of shortage in goods delivered to unfinished buildings, and such cases seem to afford the largest opportunity for errors. The surest method to pursue under such circumstances is to mark on each package its contents and designate the floor or room for which it is intended, and then call for the foreman of the work to check them before signing receipt. For any error in the contents of the packages the salesman is, of course, directly responsible, and he should send out no bill of Hardware that is not first looked over and checked back by somebody who is acquainted with the goods.

An Interesting Section of Shelving

The accompanying illustration represents a section of shelving, a line of which extends along a portion of one side of the retail department of Dame, Stoddard & Kendall, 374 Washington street, Boston, Mass. This shelving has replaced some of less modern construction, and was especially designed for convenience and for the more satisfactory display of the goods. The space under the ledge is fitted with fronts similar to roll top desks, which slide upward and back, protecting the goods from dirt and dust, and being entirely out of the way when opened. The cupboards under the ledge are devoted to duplicate stock in full packages. Metal steps fastened to the uprights enable the salesman readily to reach the higher goods in the cases above. Immediately above the ledge is an open space for miscellaneous goods, which is utilized for keeping fancy wood bread plates. The cases above are provided with plate glass sash hung with weights, which when raised slide above the cornice at the top. Three drawers in the section contain such goods as are too small to exhibit on the racks above. The drawers are equal in hight to the lower rail of the sash, and are consequently obscured from view when the sash is down. The racks on which the goods are sampled each consist of two strips of wood, one at the front and the other near the back of the case, placed at unequal hights. The front strip is a round piece with a groove at the back sufficient to allow the handles of the goods to rest in it. The back piece is not grooved, but the blades or tangs rest on the top, making the goods plainly visible to customers. The section to the right of the one shown is shelved, alternate shelves being cut in to permit of displaying sets of Carvers and other goods in cases, with the covers raised. Other sections are arranged with special reference to the goods for which they are designed. The cases are handsomely finished and trimmed and present an elegant appearance.



An Interesting Section of Shelving.

STOVE TRADE NOTES.

Cupola Management*—I.

BY DR. EDWARD KIRK.

The peculiarities in the working of every cupola must be learned before it can be run successfully, and they can only be learned by working it in different ways. It is a question very much disputed whether a cupola constructed upon the latest improved or patented design is superior to one of the old style. This question can only be decided by the intelligent working of each cupola and the advantage will always be found in favor of the one that is properly worked, no matter what its construction. It is the duty of every foundryman to give his personal attention to the working of his cupola if he has time. If he is not a practical founder or has not the time to devote to this branch of the business that it requires, then he should have his foundry foreman give it his personal attention for a sufficient length of time each day to see that everything is right in and about the cupola.

No cupola can be run successfully by any given rule or set of rules, for conditions arise to which the rules do not apply. I shall therefore not only give directions for the proper working of a cupola at every point, but shall also give the results or effect of bad working at every point, so that the founder when he finds his cupola is not operating well may have some data from which to draw conclusions and be able to overcome the difficulty.

Drying the Lining.

The cupola having been newly lined, nothing is to be done to the lining for the first heat but to dry it. A very high or prolonged heat is not required for this when only one thickness of brick is put in and laid up in thin grout. The lining may be dried by making a wood fire after the sand bottom is put in, or by starting the fire for the heat a little sooner than usual. But the fire must not be started too early or the bed will be burned too much and the cupola filled with ashes, which will retard the melting.

When a backing or filling of wet clay or sand several inches thick is put in between the casing and lining, more time and care are required in drying. It must then be dried slowly and evenly, or the filling will crack, and when jarred in chipping out will crumble and work out through cracks in the lining or holes in the casing and leave cavities behind the lining. When a lining is put in in this way, the doors are put up and covered with sand and a good coal or coke fire is made in the cupola and allowed to remain in over night. In the morning the bottom is dropped to remove the ashes and cool off the lining before making up the sand bottom for a heat.

Putting up the Doors.

The first thing to be done when making up the cupola for a heat is to put up the bottom doors. When the cupola is of small diameter and the door light it may be raised into place and supported by one man. But when the door is heavy two men are required, and if the cupola is a large one and the door made in two parts, three men are required to lift and support them. Two men get inside the cupola and raise one-half into place while the third man supports it with a temporary prop; they then raise the other half as far as it can be raised with their bodies between the two doors, where it is supported by a temporary prop. The men then get under the door on their hands and knees and raise it into place on their backs, where it is supported by a prop.

Numerous devices have been arranged for raising the doors into place, but they soon get out of order from the heat of the dump or carelessness in manipulation and they have almost all been abandoned. When the cupola is very small and the door light it is sometimes supported by an iron bolt attached to the under side of the bottom plate at the front, where it can be readily withdrawn with an iron hook to drop the bottom. But the doors are generally supported by a stout iron prop or post placed under the door near the edge opposite the hinges. Double doors are supported by a stout iron prop in the center and generally a light one at each end of the doors to prevent them springing when charging the fuel and iron, or by a sudden settling of the stock, as may occur when melting large chunks. A great many melters have no permanent foundation under the cupola upon which to place the main prop, but make one every heat by laying down a small plate upon the sand and setting the prop upon it. The plate is often placed too high or too low, making the prop too long or too short, and the plate must be raised by putting a little more sand under it or lowered by scraping away a little sand. While this is being done the heavy iron prop, which frequently requires two men to handle in the cramped position in which they are placed under the cupola, has often to be put up and taken down two or three times before it is got in the right position to support the doors.

All this extra labor can be avoided and time saved by imbedding a heavy cast iron block in the floor or foundation under the cupola for the prop to rest upon. It must extend down a sufficient distance to insure its not being disturbed when shoveling out the dump. A block 6 inches square and 10 inches long, placed with the end level with the floor, will seldom be displaced, and makes a sure foundation for the prop. The size of prop required to support a bottom depends upon the size of cupola. In small cupolas the stock is supported to a large extent by pressure against the lining, while in large cupolas the stock is supported almost entirely by the prop. For small cupolas the props are made from 1½ to 2 inches diameter, and for large cupolas from 3 to 3½ inches diameter.

The props for large cupolas not only have a greater weight to support, but they are seldom pulled out of the dump and are therefore if light liable to be bent and twisted to such an extent as to render them useless. For this reason they are often made heavier than is actually necessary for the support of the bottom. Quite a number of foundrymen have adopted the plan of attaching a ring to the prop near the top or bottom with which to draw it from the dump and avoid heating it. The ring is made large and hangs loosely, or as a long loop which stands out from the prop. When the prop is to be removed a hook is placed in the ring or loop and a quick jerk given, which releases it, and it is at once drawn from under the cupola.

Some of the old melters never use the iron prop, but measure and cut a new wood prop for their cupola every heat. Many of them are so superatitious that they think the cupola would not melt without the new prop and they would rather give up their job than try it. Such melters are not so plentiful now as they were 20 years ago, when I first began traveling as a melter through this country and Canada, but I find when visiting foundries there are still a few of them left.

Dropping the Doors.

When it is desired to drop the doors it is done by removing the props or drawing the bolt. The small props are first taken out, being released by a stroke of the hammer, and are carefully laid away so they will not be bent by the heat of the dump. A long bar with a handle on one end and a large hook on the other is then placed under the cupola with the hook behind the main prop and about 10 or 12 inches from it. By a sudden jerk of the bar the hook is made to strike the bottom of the prop a sufficiently hard blow to knock it out of place and permit the door or doors to drop. Two or more blows of the bar are sometimes necessary to release the prop, but it can always be released in this way. The prop can also be released by striking it at the top with a straight bar, but it is oftener missed than hit, and many thrusts are sometimes required to bring it down. Bolts are only used on small cupolas from which the dump falls slowly and the bolt can generally be withdrawn by a blow of the hammer without danger to the melter. If it cannot be withdrawn in this way without danger of burning the melter, a hook is made on the end of the bolt or a ring placed in it so that it may be drawn with a hooked bar or struck with a long straight bar.

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THE FOLLOWING are the names of the directors of the Lebanon Stove Works, Lebanon, Pa., chosen at a recent meeting of the stockholders: H. H. Kreider, F. Meily, A. S. Light, J. H. Seltzer, D. W. Zeller and H. A. Reinoehl. At a subsequent meeting the Board of Directors elected H. H. Kreider president, A. S. Light secretary, J. H. Seltzer treasurer, and J. M. Reilley manager. The company recently resumed operations, and have been running full time on orders which, Manager Reilley states, will keep them busy

until June 1. A new plating department is to be added to the plant and hereafter the nickeling, which has been done by outside parties, will be performed under their own roof.

A Commendable Movement.

In our issue for last week we called attention to the fact that the Buck's Stove & Range Company of St. Louis, Mo., had arranged to resume operations for a period of 60 days with a force of 350 men. According to the notice sent out by the company there is to be no reduction in wages for the present, but the starting of the foundry is more to give the hands midwinter employment than to meet the demands of the company's business. This movement is regarded as practically a solution of the question how to provide for those at present unemployed. Manager J. W. Van Cleave of the company figures out that in 60 days they will distribute $25,000 in wages, and thus tide over the 350 families dependent upon their men until March. The interest on the $25,000 until such time as the goods can be sold is figured at $500, which may be regarded as the company's donation to charity. Mr. Van Cleave says that it is much better to open the foundry during the months of January and February, even if it is necessary to close again in summer. If business picks up later on and there is no necessity for closing the workmen are that much better off. It requires no argument, he says, to prove that 60 days' employment at this time carries with it more real benefits and comforts than 60 days in the summer, when living is cheaper and the opportunity for open air employment many fold greater than in the winter. The plan of the company is certainly one to be commended, as money donated in this way goes much further in relieving the requirements of the deserving than an equal amount given outright. There is no question that if imitated when feasible by other concerns which are closed down much good would result and the scheme prove to be the means of dispensing charity far more satisfactorily than any yet devised.

Stove Trade Reminiscences.

BY JEEMS

Regarding what Old Mack says about "Ould Tim" in your edition of the 13th. Tim says he worked for Cunningham & Wilson, at 233 or 235 Water street, in 1831. He does not remember the number, but it is one of those small stores where the Repair Association is located. The Jim Cunningham Mack speaks of was a boy there then. He kept on Water street and afterward on Grand street. I regret to say Tim will soon be of the past. He was struck down by paralysis while at the bench and no hope is entertained of his recovery. The allusion to Tim's fondness for the past was not made to hurt any one's feelings, because the past must always have an interest for us all. But the rapidity with which changes take place at the present time renders it almost impossible to the progressive man to dwell too much upon "what we used to do," &c. We did, but we don't do it now, but what we will do no feller can tell. But if you want to keep up with the advance you will have to unload lots of the past or you will sink under the burden. When you get religion you have got to be born again, so the parson says, and I imagine if you want to keep up with the newness of the new and the whichness of the thus, you will want to be born new about every week, judging by the way things are working. They are putting up lots of immense office buildings in New York, fitted up in regal style. The question is asked, where are the people coming from to occupy them, and what kind of business they can do? "Can't keep shops, you know, or store goods, and it costs money to run an office and live in New York." There isn't much guide in the past of what is going to be done, but the future will tell.

ODD PLATES.

F. M. Borden of F. M. Borden & Bro., 118-122 North Second street, Philadelphia, is making a business and pleasure trip through Florida accompanied by his wife. Splendid Novelty and New Process gasoline stoves and Challenge Iceberg refrigerators will not be the only theme of his conversation, and the dealers of the State who miss his call will lose the pleasure of entertaining a genial visitor.

The plant of the Littlefield Stove Company, at Albany, N. Y., opened Monday, January 22, and about 125 employees are now at work.

The Albany Facing Mill Company of Albany, N. Y., have been incorporated with a capital stock of $10,000 to manufacture foundry facings and foundry supplies.

At the annual meeting of the stockholders of the Bellaire Stove Foundry Company, Bellaire, Ohio, the old Board of Directors were re-elected, with the exception of E. C. Boyd, who was succeeded by J. B. Montgomery. The board organized by electing H. Roemer president and treasurer, E. H. Rider secretary, and Robert Johnson manager.

At the recent annual meeting of the stockholders of the Woolridge Stove Company of Memphis, Tenn., the following directors were elected: G. W. Macrae, J C. Neely, E G Robinson, T. J. Latham, Lawrence Simpson, John Overton, Jr, and G. M. Brasfield. The board then organized by the election of G. M. Brasfield as president, T. J. Latham, vice-president; W. H. Woolridge, superintendent; George S. Fox, secretary and treasurer.

The Portland Stove Foundry Company of Portland, Maine, resumed operations last week on full time, giving employment to 60 men.

A heater using gas made from kerosene oil as a fuel has recently been exhibited in Meriden, Conn., by L. H. Curtis, who is a large stockholder in the Rock Oil Fuel Oil Company, which we understand is to be reorganized. It is claimed that no odor or smoke is emitted from the stove and the consumption of oil is small.

J. J. Tonkin has recently become interested in the tubular hot air furnace invented by W. A. Kitts of Oswego, N. Y., and its manufacture is to be undertaken on an extensive scale. We understand that the furnace has given very satisfactory results in operation during the past winter in Oswego, demonstrating the fact that it is easily cared for and can be operated with an economical consumption of fuel.

According to a press dispatch from Reading, Pa., the entire plant of the Mount Penu Stove Works of that city, which has been idle for four weeks, resumed operations on January 23, giving employment to 200 persons.

We have received from the Baxter Stove Company, Mansfield, Ohio, a copy of their illustrated "D" catalogue relating to Monarch stoves and ranges for gas and gasoline. The 64 pages of which the volume is composed are beautifully printed in two colors upon tinted paper, the borders of each page being white. The frontispiece is a bird's eye view of the company's works at Mansfield, facing which is a group representing Thomas Baxter and his seven sons. The special features of the Monarch goods are set forth in a style to interest the dealer, and illustrations faithfully represent the appearance of the finished goods. Ample descriptive letterpress accompanies the engravings, while a telegraphic code enables the dealer to order goods by wire at a minimum of expense. With the stoves and ranges are presented illustrations of fixtures in the way of independent connections, tubing, burners, ovens, broilers, &c. The catalogue is very neatly arranged and is issued in attractive colored paper covers with embossed side title in gilt.

John Caleb Hollands of the Griswold Mfg. Company, Erie, Pa., sends us the compliments of the season and a miniature Erie griddle, with a patriotic folder printed in red and blue on white cardboard. The folder contains some "sauce" which is intended to prevent hot cakes from Erie griddles from ever producing indigestion. Griddles are a seasonable article from the varied line of plain, polished and enameled hollow ware made by the house.

Charles O Lyon, president of the Thatcher Furnace Company, 33 Peck Slip, New York, has left for Florida to spend a well earned vacation, having had none during the year 1893. He will be absent some three weeks, enjoying himself among the orange groves.

The Manhattan Gas Heating Company make a fine display of the Manhattan open grate gas heater in their showrooms at their office and factory at Fifty seventh street and Seventh avenue, New York. It consists of a specially constructed atmospheric burner with the flame burning against asbestos fiber. The size of the burner varies with the size of the grates, which are made in over 20 different styles and sizes. Some are made in cast iron, both nickel plated and copper bronzed; others are made of plain and hammered brass, either highly polished or nickel plated. The average consumption of gas is said to be about 20 cubic feet per hour, and the grates are capable of heating a room as large as 25 feet square. They act as ventilators as well as heaters, being made to connect with a flue.

The Eclipse Stove Company of Mansfield, Ohio, recently held their annual election, at which the following directors were selected: J. M. Maring of Muncie, Ind.; W. H. Gorby of Pittsburgh, Pa., and H. M. Loomis, E. B. Tappan and W. J. Tappan of Mansfield, Ohio. The Board of Directors then organized by electing J. M. Maring president, W. H. Gorby vice-president, W. J. Tappan secretary and treasurer, and A. Blanchard superintendent.

Samuel Biddle, formerly with the Keeley Stove Company and lately with Faith, Belson & Co. of Philadelphia, is visiting the trade in New Jersey in

the interests of Reeves & Horner of Philadelphia. Sam can use his knowledge of the trade in that section to the advantage of his new house.

V. Clad & Sons of Philadelphia have been awarded the contract for supplying the ranges, broilers, coffee urns, carving tables and complete kitchen equipment for the new restaurant of the Pennsylvania R. R. Company at Broad street station, Philadelphia.

Since the ordinance giving Philadelphia gas at $1 per 1000 feet was passed there have been numbers of inquiries among the stove trade in that city relative to gas stoves. Salesmen are posting themselves on gas consumption statistics, and are taking advantage of the opportunity to largely increase the sales of gas stoves.

The Grander Stove Company of Royersford, Pa., have started their pattern department on full time, and their foundry is now running two heats each week.

The Western Foundry Company have equipped a large plant on Albany avenue near Thirty-eighth street, Chicago, for the special production of light gray iron castings. They aim to produce smooth, soft castings, true to pattern, and make a specialty of such work as sewing machine castings, gasoline stove burners, stove plate castings and hardware specialties. They also do fitting and japanning. The demand for castings of this character is steadily increasing in the West, and the Western Foundry Company will endeavor to secure their share of this trade, which has to a great extent been enjoyed by distant foundries. Their main office is in room 813, Royal Insurance Building, Chicago. D. F. O'Neil is president, N. F. Purcell is manager, and M. A. Rourke is secretary and treasurer.

The Quick Meal Stove Company, St. Louis, Mo., report an excellent demand for their Quick Meal gas and gasoline stoves and ranges. At this writing they have received orders for 26 carloads. They are at work on a pamphlet devoted exclusively to their Quick Meal gas stoves, which will shortly be ready to be mailed to the trade.

At the annual election held by the stockholders of the Western Stove Company, St. Louis, Jos. Dugdale was elected president and Lucas Edel secretary and treasurer. The trade will be interested to know that Mr. Dugdale, who has been president of this company for a number of years, again resumes that position.

S. H. Shannon, who has for many years represented the Excelsior Mfg. Company in Southern Texas, will continue to look after their interests in that State, with headquarters at 4 Dallas Club Building, Dallas. George P. Philip, formerly of the firm of Cameron & Philip, at Abilene, will assist Mr. Shannon in the territory named. Mr. Shannon has issued, under recent date, a circular in which reference to the above matter is made, and also the statement that he has consummated arrangements to represent the following firms, and will be the sole agent for the sale of their products in Texas: Lalance & Groajean Mfg. Company, New York, makers of agate iron ware, stamped ware, &c.; Reading Iron Works, Reading, Pa., manufacturers of wrought iron pipe and tubing, and the Cincinnati Corrugating Company, Piqua, Ohio, makers of black and galvanized sheet and corrugated iron. Mr. Shannon has a host of friends in Texas, among whom are many of the best people in the State. He has always made it a point to look after the interests of his customers as well as guarding those of the concerns which he represents.

The Ohio Crude Petroleum Oil Stove Company of Ironton, Ohio, is the name of a concern recently incorporated with a capital stock of $200,000. The officers are W. M. Kerr, president; H. A. Marting, vice-president; L. E. Marting, treasurer; J. D. Foster, secretary and general manager, and Charles A. Hammel, assistant manager. The business of the new concern will be the manufacture of burners which are applicable to stoves, experiments in this direction having been conducted for nearly a year past at the Foster Stove Works. At present the burners will be turned out by this company and will be applied to their goods.

Newspaper reports from the West are to the effect that one half of the plant of the Great Western Stove Works, at Leavenworth, Kan., has resumed operations, and that the entire works will be in operation by February 1.

The Troy Nickel Works, Troy, N. Y., have established a branch of their business at 33 Front street, West, Toronto, Ont., under the management of Francis Foster & Co., where a full stock of the Alaska hardware specialties, embracing their complete line, will be carried for the trade for the Dominion of Canada. The opportunity is thus afforded for large and small dealers to obtain these goods promptly and in quantities to suit at the manufacturers' prices.

J. B. Oldershaw of Baltimore, Md., has issued a four-page circular relating to the Rapid Transit air circulating and ventilating stove. The merits of this heater are set forth at some length in the circular before us, and the stove is illustrated in general view. Accompanying the folder is a circular calling attention to the National adjustable cast iron chimney cap and ventilator, which is manufactured and sold by Mr. Oldershaw.

A circular has been issued under recent date to the effect that the foundry facing and supply business heretofore carried on under the name of E. D. Ransom & Co. of Albany, N. Y., was, on January 15, sold to the Albany Facing Mill Company, of whom M. J. Powers is vice-president and manager. Mr. Powers was for a long time the representative of E. D. Ransom & Co., and is thoroughly familiar with all the details of the business. The new concern state that they are in a position to supply everything needed in the foundry and machine shop line, and that their stove plate and return facings are of a high order of merit. The company are also dealers in Albany molding sand, and will continue to manufacture the well-known stove putty.

Head's Iron Foundry, Utica, N. Y., manufacturers of the Standard and Rival furnaces, has been succeeded by the firm of Giblin & Co. The new name, however, involves no change whatever in the management of the business, which will be continued in the same hands as heretofore. The firm are very well pleased with the business of last year, as the report shows that their sales approach closely the largest sales of former years. A good business is anticipated for the coming year, to meet which, we understand, they have brought out many new improvements in their line of furnaces and boilers. The engagement of the former salesmen of the firm has been renewed, and they are to cover territory as follows: Geo. J. Giblin, Pennsylvania, New Jersey, Maryland and the territory west of Chicago; Henry Cowles, New York State and the New England States, and Robt. Jagers, Michigan, Ohio and Indiana.

The Michigan Stove Company have an enterprising customer, at Benton, Wis., whose name is W. H. Nehls. Mr. Nehls has brought out a calendar for 1894, the principal feature of which is a half-tone engraving entitled "Home Treasures." It is a reproduction of a photograph of his little daughter sitting beside a Garland Junior range. The little girl nurses a doll. On the opposite side of the range is her pet dog. A toy cat is also introduced in the picture, as apparently enjoying the genial presence of the range. All the details of the figures are well brought out. The work reflects credit on the originator of the subjects of illustration, as well as the engraver, and the calendar must be highly appreciated by Mr. Nehl's neighbors and patrons.

The Walker & Pratt Mfg. Company, manufacturers of stoves and heating apparatus at Watertown, Mass., have started up their foundry after completing repairs. Almost the full complement of 200 men were given work.

The Star Cornice & Furnace Company of 716 Vandeventer avenue, St. Louis, Mo., have issued their first catalogue of the Star steel plate furnace, which they manufacture. Within the pages of this little work are briefly set forth a few of the advantages possessed by the furnace named, so far as construction is concerned, reference being made to material, quality of workmanship, &c. Views are presented showing the interior arrangement of parts, and also of the heater as it appears when set up for operation.

The Eclipse Stove Company, Mansfield, Ohio, are sending to their friends in the trade a very handsome souvenir in the form of a small thermometer, mounted upon a silvered sheet of metal measuring about 4½ x 6½ inches. The sheet is cut out in design and bears upon its face the well-known trade-mark of the company, together with the words "Every stove warranted." Opposite the 90° point on the thermometer is a wide black mark bearing the imprint in silver: "Point at which an Eclipse heater will keep mercury in the coldest of weather." And likewise opposite the 20° to 50° register is a similar mark, with the words: "Point at which it is desirable to have a stock of Eclipse heaters." The whole is a very clever piece of work gotten up in attractive form for advertising purposes.

The Board of Directors of the Buckwalter Stove Company, Royersford, Pa., organized on Saturday, January 20, by electing J. A Buckwalter president, I. Newton Buckwalter vice-president, Darlington Buckwalter treasurer, and William Stauffer secretary and superintendent.

The Cincinnati office of *The Metal Worker* was the recipient of a call early last week from F. V. Knauss, president and general manager of the Portsmouth Stove & Range Company, Portsmouth, Ohio. The company are booming their Model steel ranges, and state that the reception of these goods

by the trade at large has been very satisfactory. Announcement is made by the firm that the Model cannot be duplicated by any other manufacturer by reason of exclusive patents covering its construction, the rights of which are possessed by the company.

The Baxter Stove Company of Marsfield, Ohio, have elected John L. Baxter president for the ensuing year; C. C. Baxter, vice-president; Emmett C. Baxter, secretary and treasurer, and Edwin D. Baxter, superintendent.

The Favorite Stove & Range Company of Piqua, Ohio, resumed operations in their works on Monday, January 22, giving employment to several hundred hands.

News and Notes.

The Mayor of Cincinnati has been authorized to expend $100,000 of the contingent funds of the city in providing work for the unemployed.

Cotton manufacturing in the Carolinas is apparently the most profitable business now carried on in the South. At meetings of stockholders of nearly all the mills of North and South Carolina, held recently, it is stated that the reports presented were uniformly gratifying, and dividends ranging from 8 to 16 per cent. were declared.

French papers say that 1893 was the best vintage year of the century, the weather having been peculiarly favorable for the grape crop.

With the view of averting a threatened loss of trade consequent on the opening of the Manchester Ship Canal, Liverpool is reducing her port charges and making other concessions.

Buffalo advices report that an alarming influx of vagabonds and mendicants is taking place in that city, most of whom have come on from Chicago, where Mayor Hopkins' "no-work-no-food" order has made their business unprofitable. A steady stream of tramps and unemployed from the West is said to be moving toward the Eastern cities.

The unusual spectacle of labor giving financial assistance to capital has been afforded recently at Pittsburgh, where the Window Glass Workers' Council has loaned the sum of $50,000 to a local glass manufacturing concern to enable them to keep their works in operation.

November's fire losses show a continuation of the enormous figures recorded for each month of this year. The total fire waste of this country will probably pass the $150,000,000 mark before the end of the year; a state of things unparalleled since the big Chicago conflagration.

An interesting feature of the International Exhibition to be opened at Antwerp in May, 1894, will be the exposition, or competition for prizes, of the packing of goods in cases. It is intended to bring out the best methods of packing for various kinds of merchandise.

Dun's Review, in a carefully prepared table, gives the result of an inquiry made by them into the extent of the financial depression of 1892, as affecting the leading industries of the country. The exhibit—although, of course, not absolutely accurate, as many leading houses in the various trades failed to respond—serves to show approximately the vast injury done to the business of the United States by the panic and uncertainty of last year. In the iron and steel trade, for example, 147 reports were received, which, in the aggregate, show a decline of 39.8 per cent. Of these replies, 86 from the Eastern trade give an average decline of 32.9 per cent.; 37 from the West, 57.1 per cent., and 24 from the South, 56 0 per cent. of falling off. In the hardware trade, as represented in 66 reports, the decline was not nearly so pronounced, being in the aggregate but 18.5 per cent., as compared with the business of 1892. Territorially the respective declines were as follows: East, 17.4 per cent.; West, 25.2 per cent., and South, 14.8 per cent.

The King of Korea is rapidly adopting the conveniences of Western civilization. His Majesty has lately purchased in America an incandescent electric light plant, which is now being installed in his palace, consisting of 2000 lamps of 16 candle power, with steam engine, dynamos, &c., complete.

Trade Notes.

At New Philadelphia, Ohio, the New Philadelphia Iron & Steel Company are running part of their Sheet mills, and the new galvanizing plant is nearly completed. The New Philadelphia Wire Nail Works are running double time, with plenty of orders ahead.

The Joseph Dixon Crucble Company, Jersey City, N. J., are preparing to issue early in February a pamphlet on Lubricating Graphite. Last year they issued such a pamphlet embodying the opinion of Prof. R. H. Thurston. Since then they have collected much additional information that they will publish in the new pamphlet.

Reeves & Horner of 45 North Second street, Philadelphia, have been appointed agents for Pennaylvania, New Jersey, Delaware and Maryland for the Kankakee Mfg. Company of Kankakee, Ill., manufacturers of Refrigerators.

In another column will be observed an announcement by E. Bissell, Son & Co., 12 Murray street and 15 Park place, New York, relative to a peremptory sale of Hardware, Edge Tools, &c., on February 1. The goods thus disposed of will include Drawing Knives. Hatchets, Screw Drivers, Chisels, Hammers, Curry Combs, Files, Plumbs and Levels, &c., and also over 400 cases of Tacks and Nails manufactured by the Stanley Works.

The American Seal Paints and Cements, made by William Connors of Troy, N. Y., are brought to the notice of the public by an attractive calendar distributed to the trade. The poster is of large size, the calendar proper occupying half the sheet, being printed in white upon a brown background. The upper portion of the poster, which is the decorative feature, shows a small boy and a large plug hat, the latter being decorated by the former in an inartistic manner with American Seal Paint. The Cements are intended for slate, tile and metal roofs, stoves, ranges and furnaces.

An advertisement of more than usual interest to the plumbing trade is the page announcement in this issue of Benjamin C. Smith, 275 Pearl street, New York City. There are illustrated a number of Porcelain Enameled Iron Bathtubs of all sizes and styles of finish. In addition to Bathtubs Mr. Smith carries a general line of plumbers, supplies and sanitary specialties.

We have received from Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, a copy of the new edition of their complete catalogue and discount sheet, dated January, 1894. The book consists of 432 pages, and is of handy size for the pocket—6¼ x 5 inches—with a flexible cover of red cloth and red edges. A great many new goods have been added and are now for the first time illustrated and priced, while on a number of specialties the list prices have been reduced. The additions to their lines have been so numerous that in order to keep the book down to portable size whole departments have been condensed into one or two pages. As an illustration, their lately extended line of Crystal Steel Ware is confined to two pages, whereas to enumerate every article in this line would probably occupy 100 or more pages. The same is true of their Blue and White, Blue and Blue and White Enamel Ware lines. The Crystal Steel Ware referred to is a grade of goods which have been manufactured by Lalance & Grosjean for some years, but confined to special lines. They have now extended it so as to cover all the lines comprehended in their well known Agate Iron Ware. We note also large additions to the Japanned and Pieced Tinware departments.

An elaborate and handsomely printed catalogue and price-list is issued by the Iron Clad Mfg. Company of New York. It is a cloth bound volume 9 x 12 inches in size, 111 pages, and as announced in a prefatory note it contains a complete line of all the goods manufactured by this concern up to date, and is offered as a substitute for previous publications, many price-lists in which have been changed or withdrawn. The volume contains many specialties, new since the last general catalogue was issued. A new feature in thia catalogue is the designating of articles by numbers instead of capacity or dimensions, which is done to avoid confusion and mistakes. Their customers are requested not to order "the same as last," but to specify the gooda in each case. This is a matter that has been referred to by other firms in various lines of business, and the amount of trouble and possibility of error involved in thia careless way of ordering goods is not appreciated by the buyer. The volume is most thoroughly illustrated and is divided into sections, beginning with Iron Clad Enameled Iron Ware. Then come Milk Cans; Galvanized Iron Ware follows; then Retinned Steel Ware, Bakers' and Confectioners' Supplies, Engineers' and Mill Supplies, Range Boilers, Expansion Tanks and Boiler Stands. The Boilers include both vertical and horizontal forms of various sizes. Miscellaneous goods close the body of the pamphlet, which is concluded with an alphabetical index.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until February 15, for the steel and iron work of superstructure of the United States Court House, Custom House and Post Office at Omaha, Neb., including iron columns, floor, ceiling and roof construction, skylight, framing, &c. Drawings and specifications may be obtained from the Supervising Architect, at Washington, or at the office of the superintendent, at Omaha.

TRADE REPORT.

The Iron Market.

Reports from the leading producing and distributing centers confirm the impression, first observed last week, that there has been a distinct improvement in the demand. But it must be frankly acknowledged that the larger volume of business has been at the sacrifice of values, which have further receded, although it was thought impossible that lower prices could be reached.

The argument that crude and finished Steel could not be sold at a lower range has become so threadbare that it takes courage to repeat it. Honestly and earnestly affirmed in the past, it has been belied by the course of events. And yet it is certain that $10.50 for Bessemer Pig at Pittsburgh and less than $15.50 for Billets are rock bottom as to cost. The indications are that buyers, so often disappointed last year, are sharing that conviction and are taking hold in some branches.

In ordinary grades of Pig Iron the Southern furnaces have surrendered and are selling at lower prices. Recent contracts in the East for Cast Iron Pipe have been taken by Northern shops, but considerable inquiries for additional quantities are in the market, among others from suburbs of Boston, Syracuse, Albany and Yonkers. It is figured that between 30,000 and 40,000 tons are coming up.

In finished material the Wire trade is developing more activity. This has led to the buying of Wire Rods at about $23, Western works, and the placing of contracts for Billets. Thus far the improvement in the demand seems to have come from the general trade. The requirements originating with the railroads, the greatest customers of the Iron trade, are still amazingly small.

Pig Iron.—The New York market is quiet, although the Southern producers are somewhat weaker. Consumers are still buying from hand to mouth and are not carrying any stock, and cases are frequent when extraordinary means must be adopted to hurry Iron forward. Recent Cast Iron Pipe contracts have been taken by Eastern shops, R. D. Wood taking the Brockton 1800-ton order at $22.89 delivered, while Emaus captured 1000 tons for Cambridge, Mass. We quote standard brands, $13 @ $14 for No. 1; $12.50 @ $13 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $13.50 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12 for No. 3; $11.25 @ $12 for No. 2 Soft, and $12 @ $12.50 for No. 1 Soft.

The volume of business in Pig Iron in the Philadelphia market has been heavier than for some time past, and from the number of applications for prices it is thought probable that the next two or three weeks will show something still heavier. Nothing favorable can be said in regard to prices, but if the demand keeps up as expected prices will take care of themselves. The demand in the meanwhile is for consumption pure and simple, and not because Iron is cheap. It is thought that consumption is not more than 60 per cent. of what it was a year ago, so that there is room for improvement, even if there is no change in prices. Two or three large lots that are about to be closed are expected to be at the lowest figures yet recorded, not that the market is in any worse condition, but because this is almost the first opportunity that holders have had for unloading good sized lots, and they are not likely to miss their opportunity for 25¢ @ 50¢ ℔ ton. General quotations for city or nearby deliveries are about as follows:

No. 1 Foundry	$13.75 @ $14.25
No. 2 Foundry	13.00 @ 13.25

Sellers of local Coke in Chicago report an excellent trade in carload lots but very little doing in larger quantities. Southern Iron is also moving in that market in small lots only and consumers are not disposed to contract ahead. Prices continue to show a drooping tendency. Competition for business is, if anything, more keen than it has been, and wherever Northern and Southern Irons come in contact the price named on the former is such as to take the business. Lake Superior Charcoal is moving in a small way, and on carload lots a much better price is obtained than if buyers were making large contracts. Transactions of this kind are reported somewhat above our quotations. Quotations are now as follows for cash:

Lake Superior Charcoal	$15.30 @ $15.50
Local Coke Foundry, No. 1	13.00 @ 13.50
Local Coke Foundry, No. 2	12.50 @ 12.75
Local Coke Foundry, No. 3	12.00 @ 12.50
Local Scotch	13.50 @ 14.00
Ohio Strong Softeners No. 1	15.00 @ 15.50
Southern Silvery, No. 1	..... @ 13.75
Southern Silvery, No. 2	..... @ 13.25
Southern Coke, No. 2	11.65 @ 11.90
Southern Coke, No. 3	11.40 @ 11.65
Southern, No. 1, Soft	11.65 @ 11.90
Southern, No. 2, Soft	11.40 @ 11.65
Tennessee Charcoal, No. 1	16.00 @ 16.50
Tennessee Charcoal, No. 2	..... @ 15.00
Alabama Car Wheel	18.00 @ 18.50
Jackson County Silvery	16.00 @ 16.50
Other Ohio Silvery	15.00 @ 15.50

Advices from the Pittsburgh district intimate that the Pig Iron market there shows no material change, either as regards demand or prices, except that prices hinted at last week are openly quoted this week. Quotations are given as follows:

No. 1 Foundry	$11.75 @ $12.00, cash
No. 2 Foundry	11.25 @ 11.50 "

There is no improvement in the tone of the Southern Pig Iron markets. On the contrary it is evident that no large sales of Southern Iron could be effected without making concessions, which would doubtless be done if there was shown to be any disposition to buy in a large way at lower prices. The jobbing foundries have generally completed their contracts for the finished product, and will not buy the raw material until they have use for it. And so there is little more than single car lots selling to them. Consumers in November contracted for more Iron than they required and are now taking it on old contracts and probably will continue to do so, so that there is more melting of Pig Iron than there is selling, and yet if it was all purchased now it would not amount to a satisfactory volume of business, and yet there are some indications that there will be an increase in the demand for many articles in the not far distant future. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$11.75 @ $12.00
Southern Coke, No. 2	10.75 @ 11.00
Southern Coke, No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—The distinctively new features in the market for this metal are that prices have averaged lower, and that a few hundred tons of "duty paid" Tin have been placed upon the market by dealers who would not buy from the leading holders of Tin imported prior to the date that the McKinley duty went into effect. That there was a financial loss in selling duty paid Tin on the basis of current quotations is obvious, but that little circumstance seemed to have been greatly personal, or sentimental, and has had no direct bearing upon the market. In any event evidence is wanting that either jobbers or consumers have deviated in the slightest degree from their former policy of buying in a conservative way, and the speculative interest has not enlivened affairs perceptibly. Spot and current month delivery has been offered freely at 20¢, and March

delivery at a shade less. June delivery was offered at 19.90¢, July at 19.50¢, August at 19.25¢, September at 19¢, October at 18.75¢ and November at 18.50¢, on the Exchange.

Copper.—There have been no really new developments. The demand is slower, if anything, than it was a week ago and sellers have refrained from doing anything that would afford a basis for suggestion of weakness in the market. The fact is demonstrated, however, that it is easier to buy than to sell Lake Superior Ingot at 10¢, and that other varieties of Copper are not in a more enviable position. Still there is the redeeming feature that Brass manufacturers are more busily engaged and that there has been some improvement latterly in the demand for their goods and that the market for several lines of manufactured Copper shows some improvement. A better price than 10¢ for round lots of Lake Superior Ingot is strictly the exception, however, where actual sales are involved, and other varieties are on about the same basis. Jobbers' prices for small lots of Ingot Copper remain unchanged, with rather more inquiry and a slight increase in orders.

Sheet Copper.—The consumptive demand for Sheet Copper has shown rather more life during the past week, although still remaining considerably below the average for the season. One or two comparatively large contracts have been negotiated, but as a rule orders are confined to moderate quantities for immediate use. Prices remain the same as previously quoted on all manufactured Copper.

Pig Lead.—About 200 tons of common Western have been sold at 3.17½¢ delivered here, prompt and near future shipment. Nearly if not the entire quantity went to consumers. This class of buyers are not offering above 3.15¢ at the moment, and manifest extreme indifference. A few speculators bid 3.15¢ for single carload lots, but their offers seem to be nicely timed, as though intended for speculative effect. The fact cannot be disguised, however, that the market remains in poor condition, nor is any material revival looked for before the early spring months.

Lead Pipe and Sheet.—No improvement is noted in the demand for Manufactured Lead or Plumbers' Supplies. The depressed condition of the building trades gives but little prospect of any large increase in the demand for these products until a sufficient revival of business develops to induce the prosecution of building operations now in suspense. Prices are inclined to weakness.

Spelter.—There have been moderate sales of common Western at 3.50¢ and a few carloads on the spot were disposed of at 3.47½¢, if, indeed, not at a shade less. As far as actual business is concerned, the market shows weak tone and there is nothing in the way of demand that tends to change the complexion of affairs in the least. In short, the market looks weak and is positively dull.

Tin Plates.—No radical change has taken place in the character of the demand for Tin Plates during the past week. The condition of the market is regarded by the trade as decidedly disappointing, the volume of business being but little more than one-fourth what it usually is at the present season. There have been some fair sales of 100 lb and lighter weight ordinary Coke for future delivery, but beyond these transactions the general demand continues to be of a perfunctory character. Stocks are generally acknowledged to be slight, yet prices are weak and on the lowest level of the season. Notwithstanding the encouragement of low prices, however, consumers cannot be induced to purchase a box in excess of their absolute needs. The market altogether is in poor shape, as regards gooda, both for spot and future delivery. It is very apparent that nothing of any magnitude will be done in Tin Plates until the settlement of the tariff question. A number of importers, it is said, are carrying purchased stocks over in England, pending tariff developments, and are drawing from them as orders come in.

A London dispatch to *The Iron Age* of January 24 reports the demand for Tin Plate in England to be somewhat better, more orders having been placed. Prices, however, continue low and generally the cheapest of the season. Full weight, 14 x 20 Bessemer Cokes went at 10/ f.o.b. Swansea, and that seems to be now a common selling price. The outlook is not regarded as encouraging for the British manufacturers. Buyers of Oil sizes are holding back with a view of obtaining still lower rates. Liverpool prices are quoted as follows:

IC Charcoal, Alloway grade	12/3 @ 12/9
IC Bessemer Steel, Coke finish	11/ @ ....
IC Siemens " " "	11/3 @ ....
IC Coke, B. V. grade, 14 x 20	11/ @ ....
Charcoal Terne, Dean grade	10/6 @ ....

The Los Angeles Iron & Steel Company of Los Angeles, Cal., have their rolling mill so well along that they expect to put it in operation about March 1. The mill will contain one stand of three-high plate rolls, 22 x 60 inches; one stand of two-high roughing rolls, 26 x 90 inches; one stand of two-high sheet rolls, 22 x 42 inches, and one three-high 20-inch muck train. They will use wrought iron scrap and steel billets, and will make Sheet Iron, Light Plates, Corrugated Roofing, and at an early day expect to add a galvanizing department. Familiar names are seen in the list of officers. F. N. Myers is president; A. S. Robbins, vice-president; J. G. Chamberlain, general manager, and Fred. R. Harris, superintendent of the mill. With men of such long experience and high standing in charge there is every reason to look for a successful career for this new enterprise.

Chicago Report.

Scrap.—Consumers are still holding off. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.50	....
No. 2, such as Shovels, Hoes, &c.	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	7.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—The condition of business is unchanged. Trade is very dull and concessions are made to move stocks. Carload lots of 12 net tons or over are still nominally quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

We learn that the connections heretofore existing between the Central Stamping Company of this city, on the one side, and the Lalance & Grosjean Mfg. Company, New York, and the St. Louis Stamping Company, St. Louis, on the other, have been severed, the two latter concerns retaining no interest, direct or indirect, in the first named. The severance has been of an entirely amicable character, and solely for the business interests of each concern. The only effect of the change will be that the Tinware heretofore manufactured and sold by the two concerns for the account of the Central Stamping Company will now be furnished directly by the Lalance & Grosjean Mfg. Company and the St. Louis Stamping Company, respectively.

M. Brendel, 509 West Twenty-eighth street, New York, issues a circular illustrating his improved fire proof Metal Lath. He specially recommends it for elevator, light, dumb waiter and ventilating shafts. He also makes the Universal Cat Fence, a device intended to keep cats off the tops of city fences. The usefulness of this last article, if successful in its operation, will be readily appreciated.

CONDITION OF THE

Hardware Trade.

THERE ARE INCREASING INDICATIONS that a turn has been reached and that business is beginning to improve. There is certainly very much more activity in mills and factories, giving employment to many thousands of operatives, some of whom have been idle for months. The good effect of this will, of course, be felt almost immediately in all lines of business. We are also in receipt of confidential advices from many representative manufacturers in the Hardware and related lines, nearly all of whom report an evident improvement in business, some of them referring to a marked increase in their orders. The jobbing trade also refer to a perceptible improvement in the volume of business, and the trade are evidently buying somewhat more freely than for some time. They are still pursuing a conservative course, and are buying only such goods as are required for their immediate use or to replenish stocks which had become too much depleted and broken. The fact that the retail trade throughout the country have a much smaller quantity of goods on hand than usual is one of the important features of the situation, as most merchants are required to purchase at once in order to be in position to meet the demands of their customers. In the matter of prices there is little improvement to note and a strengthening of the market cannot be expected until the demand assumes a large volume. The small number of failures reported since the opening of the year is an indication of the general soundness of the mercantile classes, and the apprehensions of some who anticipated a different result with the closing of last year's business have thus been disappointed. Collections generally are reported as fair. There is little doubt that the financial condition of many houses is more satisfactory now than for some time, as the past half year with its close collections and curtailment of credits has witnessed a large diminution in the indebtedness of many merchants.

Advices from Chicago.—The Shelf Hardware jobbers report a larger volume of business last week than previously. The demand continues of the same character as before. Good contracts are placed for spring delivery of seasonable goods, while the demand for Shelf Hardware is comparatively light. Reports from the building trades are encouraging, and it is believed that the low price of building material will cause an increased number of enterprises to be started up this spring, which will lead to an excellent demand for all classes of building material, which will include many articles of Hardware. Nails are even now feeling the indications of an improved condition, and retailers are ordering very freely from the jobbers. Collections are fair, and little complaint is heard of the slowness of country dealers in settling their old accounts. The Heavy Hardware trade is in hardly as good condition as Shelf Hardware, owing to the slackness of business among the smaller class of manufacturing consumers.

Notes on Prices.

Wire Nails.—There is evidence of an improved feeling in the Wire Nail market. This is seen not so much in the matter of prices as in increased demand. Manufacturers are receiving many inquiries and booking a good many orders which come to them from both the large and the smaller trade. As a consequence there is much activity in the mills, and manufacturers are feeling more confident in regard to the course of business during the season. Prices have not as yet felt to any marked degree the influence of this increased demand, and the market is still represented by the quotation of $1.10 for carload lots at mill, from which price a concession of 5¢ is made on attractive orders. Sales, however, have been made on some large orders at $1, but this is an exceptional figure which some of the manufacturers refuse under any circumstances to meet. The New York market is represented by the quotation of $1.20 on dock, with the usual advance on small lots from store.

Advices from Chicago—Manufacturers of Wire Nails report that so many orders have been booked for future delivery that prices are held more firmly. An unusual proportion of the Nails has been specified for delivery in March, and makers are beginning to fear that they will have some trouble in filling all such orders promptly, and are urging buyers to anticipate the stipulated time to make sure of getting the supply they need. Ordinary factory lots are unchanged at $1.20, Chicago. The advance recently made in Cut Tacks has thrown an increased business to the manufacturers of Wire Tacks who are thus in receipt of excellent orders in a line that for some time has been rather quiet. Jobbers have had an exceedingly good demand for Wire Nails from retailers and their shipments for the past week have been large, and yet prices are not inclined to be stiff, but to range more nearly to manufacturers' terms. Small lots from stock are quoted at $1.25 @ $1.30.

Cut Nails.—There is somewhat more inquiry for Cut Nails than during the past few weeks, and manufacturers report an increased volume of business. Prices are also somewhat firmer, if not actually higher. The market is represented by the quotation of 95 cents in carload lots at mill, from which concessions are sometimes made on attractive orders. At a recent meeting of the Eastern Cut Nail manufacturers, at which the large producers were represented, it was decided that the practice of selling at a factory price should be discontinued and the delivered price only be named. The New York price was accordingly fixed at $1.05 base for carload lots on dock. The New York market is therefore represented by this quotation, with the usual advance on small parcels from store.

Advices from Chicago.—Manufacturers of Cut Steel Nails report large inquiries from the West. Their nearby trade is continuing in about the same volume as reported last week, which was quite fair for this time of the year. Sales of Clinch and Casing Nails are much above the average in the Cut Nail trade for the past two or three years, which indicates some reaction in favor of these Nails. The price of factory lots on the regular basis is $1.15, Chicago, but concessions are made on high averages. Small lots from stock are selling at $1.20 to $1.25.

Barb Wire.—There has been little change in the Barb Wire market since our last report. A good many inquiries are being received and the manufacturers are anticipating an active demand as the season opens. There is, as mentioned in our last report, considerable divergence in the quotations of the different manufacturers, some mills selling carload lots of Galvanized Four Point at $2 and others holding firmly to $2.10.

Advices from Chicago.—The volume of business in Barb Wire is increasing. Jobbers report their customers taking hold with something of their old time freedom, doubtless influenced by the low prices now ruling, which are so much more in their favor than they had anticipated. Carload lots of Galvanized may be quoted at $2 20 to $2.25, and small lots from stock $2 30 to $2.40.

Emery.—The manufacturers of Emery have adopted the following revised list, which bears date of January 11, 1894. It will be observed that advanced prices are announced in Flour, CF, F and FF:

	Grain. Nos. 4 to 46 inclusive. Cents per lb.	Grain. Nos. 54 to 180, inclusive. Cents per lb.	Flour. CF, F & FF. Cents per lb.
In kegs of about 300 pounds	4½	5	3
½ " " 150 "	4¾	5¼	3¼
¼ " " 75 "	5	5½	3½
10 pound tin cans, ten in case	6	6½	5½
" less than " "	10	10	8

Crocus at same prices as the fine grain.

Lawn Sprinkler.—The Jewel Lawn Sprinkler, manufactured by the Detroit Sheet Metal & Brass Works, 64–72 Orleans street, Detroit, Mich., and illus-

trated in *The Metal Worker* of January 20, 1894, is sold, f.o.b. cars Detroit, 90 days, 2 per cent. for cash in 10 days, at the following net prices, according to quantity :

Per dozen	$8.00
Per dozen, gross lots	7.00
Per dozen, six gross lots	6.00

Folding Barrows.—The Champion Folding Steel Frame Wheelbarrows manufactured by the Bryan Mfg Company, Bryan, Ohio, are sold at the following net prices :

	Per doz.
Steel frame, steel wheel, wood tray	$18.00
Steel frame, steel wheel, steel tray	30.00
Steel frame, steel wheel, Garden	30.00

Grate Guard.—The Monarch Grate Guard, manufactured by the Cincinnati Mfg. Company, Cincinnati, Ohio, and illustrated in our issue of January 13, 1894, is sold assorted per dozen at $3 net.

Shoe Rest.—The Perfection Shoe Rest, manufactured by The Standard Mfg. Company, Dayton, Ohio, are sold, f. o. b. at destination, at the following net prices:

Japanned, per doz	$13.80
Nickeled, " "	18.00

Shot.—A reduction in the prices of Shot is announced under date of January 22. The revised quotations are as follows, terms net cash, 30 days, or 2 per cent. discount for cash in 10 days:

	Per bag.
Drop Shot, sizes smaller than B, 25-pound bag	$1.30
Drop Shot, sizes smaller than B, 5-pound bag	.35
Drop Shot, B and larger sizes, 25-pound bag	1.55
Drop Shot, B and larger sizes, 5 pound bag	.40
Buck and Chilled Shot, 25-pound bag	1.55
" " " " 5-pound "	.40
Dust Shot, 25-pound bag	2.00
" 5-pound "	.45

In lots of 2000 pounds and upward, taken at one time, a discount of 20 cents per 100 pounds and 2½ per cent. will be allowed.

Perfection Cutters.—The new Perfection Cutters manufactured by North Brothers Mfg. Company, Philadelphia, Pa., for whom John H. Graham & Co., 113 Chambers street, New York, are agents, are sold at the following prices, subject to a discount of 33⅓ per cent.:

No.	Each.
101	$2.00
102	2.75

Tomato Supports.—The Tomato Supports manufactured by Leonard, Lewis & Co., Utica, N. Y., for whom Wiebusch & Hilger, 84-86 Chambers street, New York, are agents, are sold at $1.80 per dozen, less a discount of 33⅓ per cent.

Glass.—The outcome of the proposition to close all Glass factories February 10 is still doubtful, but those well informed on the subject consider that there is little likelihood of a shut down at that time, as the assent of 85 per cent. of all the pots is necessary to make the agreement binding. It is understood that two of the largest plants in the country are unfavorable to the scheme, and some of the smaller plants are passing into the hands of the workers themselves. Prices on American Window Glass have not improved since our review of the market last week. New York quotations are given as 85 and 10 per cent. discount for single strength Glass, this price being shaded in some cases. Pittsburgh quotations are 85 and 10 and 5 per cent. discount on single, and 85 and 20 per cent. discount on double strength Glass. Imported Glass has been affected by the low price of American Glass and by the proposed reduction in tariff, and Window Glass is quoted at 80 and 10 and 10 and 5 to 80 and 15 per cent. discount. Imported Plate Glass is quoted at 70 and 5 to 70 and 10 per cent. discount. It is reported that a falling through of the agreement among importers to sustain prices has helped to demoralize the market. The foregoing quotations on imported Glass are referred to by those in the trade as approximately representing the selling price of imported Glass should the proposed tariff go into effect. Jobbers atate that low prices are bringing inquiries and orders for American Window Glass, and that enough Glass is being made to supply the demand.

Old Metals.—Old Metals are still in but very moderate demand, and nothing in the nature of a revival of business is yet in sight. Prices continue low and irregular. The following quotations represent about the prices paid by New York dealers for moderate sized lots:

Heavy Copper	℔ 7¢
Light and Tinned Copper	℔ 6½¢
Heavy Brass	℔ 5¢
Light Brass	℔ 4½¢
Lead	℔ 3¢
Tea Lead	℔ 2¾¢
Zinc	℔ 2½¢
No. 1 Pewter	℔ 14¢
No. 2 Pewter	℔ 6¢
Wrought Scrap Iron, ℔ gross ton	$7.00 @ $8.00
Heavy Cast Scrap, ℔ gross ton	8.00 @ 9.00
Stove Plate Scrap, ℔ gross ton	4.00 @ 5.00
Burnt Iron, ℔ gross ton	2.50 @ 3.00

Old Rags, Paper, &c.—A dull and waiting market is the characteristic feature of the trade. Paper mills are buying only enough material for their immediate requirements, and dealers in Paper Stock are well supplied with material. Prices in the New York market are quoted generally as follows:

No. 1 White Rags	℔ 3¼ @ 3⅛¢
No. 2 White Rags	℔ 2¼ @ 2⅛¢
Mixed Rags	℔ ⅞¢
Blues and 3ds	℔ 1 @ 1¼¢
Hard Sized White Shavings	℔ 2¼ @ 2⅛¢
No.1 White Book Shavings	℔ 2 @ 2⅛¢
No.2 White Book Shavings	℔ 1 @ 1⅝¢
Light Book Shavings	℔ ¾¢
No. 1 Mixed Shavings	℔ ¾ @ 1 ¢
No. 2 Mixed Shavings	℔ ½ @ ⅝¢
No. 1 Printed Books	℔ 1 @ 1¼¢
Ordinary Mixed Books	℔ ½ @ ⅝¢
Newspapers	℔ 2-5 @ ½¢
No. 1 Manila Paper	℔ 1 @ 1⅛¢
No. 2 Manila Paper	℔ ⅝ @ ¾¢
Bogus Paper	℔ ½¢
Common Paper	℔ ⅝¢
Straw Chips	℔ ½¢
Binders' Clippings	℔ ½ @ ⅝¢
Jute Butts	℔ 1⅞ @ 2 ¢
No. 1 Jute Bagging	℔ 1 @ 1¼¢
Mixed Bagging	℔ ¾ @ 1 ¢
No. 2 Bagging	℔ ½ @ ¾¢
Hemp Twine	℔ 2 @ 2½¢
Manila Rope	℔ 2½ @ 2⅝¢
Jute Rope	℔ 1½ @ 1¾¢
Mixed Rope	℔ ¾ @ ⅞¢

Old Rubber.—The market for this material remains very quiet. New York dealers' prices are nominally as follows:

Car Springs, ton lots, ℔	@ $0.03¼
Rubber Shoes, carloads, delivered at factory, ℔	@ .03
Rubber shoes, less than carloads, ℔ 0.02¼	@ .03⅛
Large Hose, ℔ ton	@ 9.00
White Wringer Rolls, ℔	@ .04¼
White Syringes, ℔	@ 05

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Metal and Miscellaneous Prices.

CHICAGO, JANUARY 25, 1894.

Tin—
Straits pigs.....23¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Oalland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100℔	.5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	..11.30 @11.50
X, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—
IC. 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—
IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—	IC, 14 x 20	$7.00
" "	IX, 14 x 20	9.00
" "	IXX, 14 x 20	11.00
" "	IC, 20 x 28	14.00
" "	IX, 20 x 28	18.00
" "	IXX, 20 x 28	22.00

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.50
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60

Irondale A:

IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50

Westmoreland:

IC, 14 x 20	$6.25
IC, 20 x 28	12.50

Elwood:

IC, 20 x 28	$12.00

Juno:

IC, 14 x 20	$5.75
IC, 20 x 28	11.50

Illinois, Old Method:

IC, 20 x 28	$17.00

E. L.:

IC, 20 x 28	$12.50

Jessie:

IC, 20 x 28	$12.00

Scott's Extra Coated, Stamped and Resqnared, IC, 14 x 20 | $9.50
Scott's Extra Coated, Stamped and Resqnared, IX, 14 x 20 | 11.00
Scott's Extra Coated, Stamped and Resqnared, IC, 20 x 28 | 19.00
Scott's Extra Coated, Stamped and Resqnared, IX, 20 x 28 | 22.00

Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—
Black.

Nos.	Common American	Refined.
10 to 16	℔ 2 6-10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3-10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5-10¢
27	℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10¾¢; B, 9½¢ dls. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality..dls.70&7½@10%

Copper—
Ingot.

Lake.....12¢ @ 12½¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 30%.

Copper Bottoms.

Discount, 30%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass	

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 ℔ casks.....4¾¢
800 ℔ casks.....5 ¢
Loose sheets.....5¼¢

Lead—
Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½@½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12¢@12½¢
Hallett's.....11¼¢@11¾¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain	00%
1¼ and under, Galv	52½%
1½ and over, Plain	70%
1½ and over, Galv	60%
Boiler Tubes, list Oct. 24, 1892	70%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—
Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—
Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd.....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—
Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling.....$4.50 square

Metallic Shingles—
Cushman's.....$1.35 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*
Discount from list.....70%

Paints, Oils, &c.—
Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ D, 2 ¢
" " Brown.....℔ D, 1½¢
" " Purple.....℔ D, 2½¢
" Ground in oil, B. Red ℔ D, 6½¢
" Ground in oil, Red..℔ D, 6½¢
" Ground in oil, Brown ℔ D, 6½¢
" Ground in oil, Purple ℔ D, 6 ¢
Linseed Oil, Boiled, in bbls.....50
Linseed Oil, Raw, in bbls.....47¢
Mineral Paints.....2@4¢
Orange Mineral.....9½¢
Pure White Lead in Oil.....6@6½¢
Dry White Lead in bbls.....5½@5¾¢
Red Lead, American.....6@0½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¾¢; kegs.....7¾¢
Sipe's Japan Oil, in bbls, ℔ gal.....82¢
Spirits Turpentine, in bbls., ℔ gal..35½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, JANUARY 26, 1894

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal (guaranteed over 94% pure Aluminum), in ton lots..... ℔ D, $0.70
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ D .75
Lots less than 1 ton, 10¢ ℔ D additional.

Antimony—
Cookson.....℔ D, 10¾¢@11¢
Hallett's.....℔ D, 10¼¢@10½¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per D.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—
3¢ ℔ D more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ D
Over 3½ to 5 inches inclusive.....18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ D
Over 3½ to 5 inches inclusive.... 19¢ ℔ D

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized	50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake	11¢
Ansonia Grade Arizona	10½¢
Ansonia Grade Casting	10¢
Planished	net
Sheet and Bolt	25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized	35%

Stove-Pipe—
Buffalo Four-Piece.
4½ 5 5½ 6 7 inch,
$0.78 .87 .90 .99 1.20 per doz..20 %

Elbows and Shoes—
Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.
Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—
Black.

Nos.	Common American.	R. G. Cleaned American.
10 to 16	℔ D, 2.70	3 ¢
17 to 20	℔ D, 2.80	3.10¢
21 to 24	℔ D, 2.90	3.20¢
25 and 26	℔ D, 3	3.30¢
27	℔ D, 3.10	3.40¢
28	℔ D, 3.15	3.50¢
American B. B.	℔ D,	4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12½¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ D, 8½¢

Galvanized.

Nos.	B. B.
10 to 16	70&5%@70 &10%
17 to 22	
23 to 24	
25 to 26	
27	
28	
29 and 30	

Filter Joints—
Lee's.....33⅓%

Lead—
American Pig.....3¾@4¢
Bar.....4¼¢
Pipe.....5½¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2¾¢ ℔ D.

Metal Exoanded—
Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¾
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1¼
Red, Venetian, American	1½ @ 2½

THE METAL WORKER.

NEW YORK AND CHICAGO.

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Glass Screens.

A very interesting series of experiments, according to reports in a German technical paper, have been made by Richard Zsigmondy of Vienna on the transmission of heat through different kinds of glass. It has long been known that bodies equally transparent did not let through the heat that accompanied the light with corresponding freedom, and, furthermore, that some opaque bodies permitted the heat to pass freely. Ordinary clear glass cut off a portion of the heat, and this quality adapted plate glass to be used as fire screens. Rock salt, on the other hand, permitted both light and heat to pass freely, while a black solution of iodine, which cut off the light entirely, offered very little obstruction to the radiant heat. All these and many similar facts have been known for a number of years, but there is still a good deal to be learned in the field of heat and light transmission if valuable practical results were to come of the investigation.

Radiant Heat and Glass.

Mr. Zsigmondy in the experiments alluded to began with the idea that alum resisted the heat rays, and so he had glass made containing a large per cent. of alumina, but while the results showed a much greater amount of heat cut off by the alum glass than by ordinary glass there was reason to suspect that the difference was rather due to the presence of iron on the surface than to the salts of aluminum in the body of the glass itself. Without describing the experiments in detail it is enough to say that, acting on the suspicion that the iron was the cause of the glass cutting off the heat, a number of specimens of glass were prepared containing from 1 to 4 per cent. of iron oxide. The first sample, containing 1 per cent., was for certain reasons the most satisfactory. The glass was about ⅛ inch thick and of a light blue color, and when tested with a gas flame it permitted less than 1 per cent. of the heat to pass, while with ordinary glass of similar thickness 60 per cent. of the heat was transmitted. Tested by the sun the iron glass transmitted 12 per cent. of the heat, compared with 86 per cent. transmitted by common glass.

Practical Applications.

The possible application of this discovery is of more than usual interest, for there is a very wide field of application to a greater or less transparent glass that will at the same time be opaque to radiant heat. The color would furthermore be an advantage in many instances, for it would add to the decorative effect of the glass. Plate glass screens for open fires could be made of such a glass to advantage, but perhaps what would be of the greatest usefulness would be lamp shades and chimneys around wicks burning kerosene. Nowadays lamps are used a great deal for evening reading as well as for general illumination, and if a transparent shade could be made which would cut off the heat from the face and head of a person reading nearby the effect would be decidedly pleasant and also probably of advantage to the health. It is to be hoped that this reported discovery is not like those many rumored inventions which are always being announced as going to revolutionize the world and which never amount to anything more than a rumor. The discovery we have referred to is, however, entirely probable, and furthermore is reported by a German technical paper of high standing.

Reformative Industrial Education.

The New York State Reformatory, at Elmira, which was established by act of Legislature in 1876, has long been taken as a model institution of its class. Its objects, as officially set forth, are to "take charge of males between the ages of 16 and 30, convicted of felony and not previously convicted of crime," and "to prevent them from committing crime, to secure their self support and to accomplish their reformation." Among the agencies utilized for this end, one which is considered of the first importance is a very complete system of trade classes, in which the prisoners are given a valuable industrial education, designed to send them forth into the world, at the expiration of their terms of detention, equipped with the means of earning an honest livelihood and so becoming useful and independent members of society. From a neatly gotten-up little book, printed and publishsd in the reformatory, we learn that no less than 1,615 inmates received instruction in the trade classes of the institution during the year 1892. Of 672 men received during the 12 months over 600 had no trade, while of 338 paroled during that period all except 47 went out to work at trades learned during their incarceration.

Trade School in Elmira.

The trade classes are held during the evenings in buildings specially adapted for the work and equipped with all modern facilities, while the tuition is given by expert instructors in the various trades. About 37 different classes are taught. Among those which have the largest number of pupils are the bricklaying and plastering, molding, plumbing, carpentry, painting, tinsmithing and brass-finishing trades. As a proof of the thoroughness of the instruction imparted it is pointed out that all the work of these trades required inside the reformatory in recent years has been carried out by the inmates, who have acquired their industrial capacity within its walls. The good thus done in sending young men, who were never hardened criminals, out into the world at the expiration of their terms of detention with the means of self-support at their fingers' ends can hardly be overestimated. Under the old penal systems a residence in prison meant, in the majority of cases, the ruin of a youth, who too often became on his release a recruit in the great army of loafers and criminals, whereas under the Elmira system he has every incentive to work out his redemption and gain his lost position through the medium of the trade knowledge that has there been put into his hands.

Trifles.

In one of Wilkie Collins' stories a stupid constable who had passed inattentively the most significant clue to a robbery because, as he said, he thought it only a trifle, is rebuked by an experienced London detective with the remark that, although much older than the constable, he had never yet seen a *trifle*. The lesson conveyed in this is that anything, no matter how trivial it may appear, has some significance and importance. It might be added with equal truth that in all mechanical and industrial operations it is the close observer and student of what to more common minds appear to be trifling matters who attains to superior skill. It is they who pay most careful attention to minute details, who firmly adhere to the principle that in their calling there is nothing so unimportant that some best way to arrange it or to perform it is not worth considering, and who strive to find the best way, that become organizers of industrial enterprises and rise to places of trust and responsibility.

Western Building Prospects

Western architects report a decided awakening in building projects. In some instances architects' offices are actually crowded with work, whereas only a short time since the prospects seemed decidedly unfavorable in the building line. There may not be many sky-scrapers among the new buildings on the boards in Chicago, but of less pretentious business structures and dwelling houses the number to be erected this spring will compare favorably with others easons. In the smaller Western cities the same conditions are reported to exist, with here and there an enterprise of some magnitude for the locality. The building trades gen erally will be far from stagnant. The change to a fair degree of activity will be hailed with pleasure by all interests involved, comprising a very important part of the business energy of the country. The building trades suffered their full share of the consequences of the depression in business which set in so acutely last spring.

Ease in money and distrust of manufacturing and commercial ventures seem to be the factors which are potent in the revival of building activity. It is certainly not because there is an urgent demand for more houses. But real estate security has ever been deemed the safest basis for investment, and it is specially attractive now to those who fret because their idle money is steadily accumulating yet dare not risk it as they freely did up to the time of the panic. A lower rate of interest can consequently be secured by owners of building lots who desire to make improvements and have long awaited a desirable opportunity. This has come not only in a lowering of the rate of interest, but also in the heavy decline in the cost of building material and wages of workmen in the building trades.

The cost of building in the largest Western cities has of late years been unreasonably augmented by the extravagant demands of the workmen. Through their unions they not only advanced their wages almost beyond precedent, but also shortened their hours of daily toil, thus making the cost of building cumulative. The edge has been rather roughly removed from the sharpness of these conditions during the past six months. Workmen who considered themselves quite poorly paid at $4 per day of eight hours of but moderately skillful labor have been known to feel thankful in securing a job paying but $10 per week, even if they were occasionally called upon to put in a 12-hour day. It is estimated that in the vicinity of Chicago, and perhaps the same is true of the West generally, the reduction in the cost of building as compared with 1892 and the early part of 1893 is about 40 per cent. The inducement to men of some means to make improvements which have long been contemplated is, therefore, seen to be quite strong.

As to speculative building, in anticipation of the wants of a home-loving people, it can be said that there never was a time more favorable than this for the consummation of building enterprises on a large scale. Cheap money, cheap material and reasonably paid labor form a combination not often seen in this country, and advantage should be taken of it when it does exist. Ere long the life-blood will again flow freely through the business arteries of the nation, the body politic will be reanimated with healthful vigor and the present languor will be succeeded by a rush of activity. It will then be found that our constantly expanding population will need more house room. Families that have been forced to huddle in a few rooms to reduce expenses will feel able to indulge in better quarters and will seek to secure them. Houses built this year will not be much, if any, in advance of the time when they will be needed.

Rustless Coating for Iron.

The following is a translation by Mr. Frederic W. North of a paper read before the Paris Société d'Encouragement by M. Octave de Rochefort-Lucay, on the new Bertrand processes for coating with magnetic oxide and enamelling iron and iron carburets, and on a new process of tinning for cast iron.

Messrs. Barff and Bower were the first to practically coat iron, steel, and cast iron with magnetic oxide, so as to form, at the cost of the metal itself, the protective layer that is obtained usually from paint, or from enameling, &c., with a thin coating of a metal that is not oxidizable.

The Bertrand processes are more simple than those of Bower and Barff, and are based on a new discovery in chemistry, and may be stated thus: If a thin adherent film of another metal is formed on the wrought iron or on the cast iron, and this iron or cast iron, heated to 1000°, is exposed to a current of oxidizing gas, the oxygen penetrates through the film, oxidizes the iron, or the cast iron, and under these conditions magnetic oxide is the result. The formation of magnetic oxide, thus obtained, continues indefinitely, and the thickness of the coating of oxide increases according to the period of exposure to the oxidizing current, providing the temperature remains at about 1000°.

As to the film of metal deposited in the first instance, it disappears in some obscure way, forming oxides which mingle with the magnetic oxide or volatilize, according to the nature of the metal of which they are composed. M. Bertrand had then to find the best metal and the best method for depositing it on the article to be coated, and he has found that bronze, a mixture of copper and tin, gives, from a practical point of view, every satisfaction. For depositing this bronze on the wrought iron and cast iron M. Bertrand uses electricity or wet baths, and uses sulphophenolic acid.

The following is the method adopted in the Bertrand manufactory for an oxidation: The article is cleansed (the cleansing is not indispensable), then dipped a few moments in a bath containing a solution of sulphophenate of copper and tin. The coating of bronze being formed, the article is immediately washed with cold water and dried with sawdust. The article dried is put into a furnace. Oxide forms, and at the end of 15 to 30 minutes (according to the articles) the article is taken out, sufficiently oxidized. The coating produced varies from $\frac{1}{10}$ to $\frac{1}{5}$ mm.

M. Bertrand uses electricity to ascertain if the coating is of sufficient and uniform thickness, and in doing so he makes use of bells. If in putting the two wires in contact with the oxidized article the bells ring the current passes —the oxidation is insufficient; if it remains silent the oxide formed is of sufficient practical thickness, because it prevents the electric current from passing.

Process for Tinning Cast Iron.—M. Bertrand has also used sulphophenolic acid to obtain tinning on iron. He dissolves salts of tin in a mixture of water and sulphophenolic acid at the rate of 1 per cent. of tin salt and 5 per cent. of sulphophenolic acid. In this mixture the article, which is previously cleaned, is dipped; and is at once covered with an adherent coating of tin, and afterward, by the means of rotating brushes in wire and cloth, the coating of tin is polished, and a result obtained which is both effective and cheap.

Process for Enameling.—There are not more than two processes for enameling cast iron. In the first, called hot, the iron, heated to a vivid red, is powdered with a flux powder (borosilicate of lead), distributed with a sieve, then it is heated, and when the flux fuses it is powdered afresh with glass, more soluble, forming the glaze of the enamel. This process, the only direct enameling, is dangerous to the operator, and even impossible for large articles, nor does it allow of decorations. The second process consists of dressing the cast iron by three distinct and successive operations in the furnace with a kind of pottery. In the Bertrand enameling, the article is first coated with magnetic oxide, then dipped in borosilicates of lead, colored by metallic oxides, in which is added a little pipe clay in order to give rather more body. The article thus covered cold, by dipping or with brushes, is put into the furnace; the enamel adheres and vitrifies at the usual furnace temperatures used by enamelers. By putting a coating of colored enamel with a brush on a first coat simply plain, it is possible to make any decorations desired, which may be burned in at one operation for outdoor vases, &c. These results, due to the first oxidation with magnetic oxide, are remarkable, as much for the color as for the tenacity of the enamel and its resistance to rough usage.—*Journal of the Society of Arts.*

The situation in the plate glass industry of the United States is reported to be very serious for the manufacturers. Most of the factories are closed, being unable to run on the former scale of wages, and prices are demoralized, while there is no market for the product. The makers claim that the present crisis is due to the proposed reduction of the duty on plate glass by the Wilson bill, which if carried into effect will bankrupt the factories.

California's Midwinter Fair was opened to the public on Saturday. The paid admissions to the grounds on that day numbered 72,248.

The population of New York City, according to recent estimates of the Bureau of Vital Statistics, is now 1,929,376.

THE LETTER BOX.

Weight of Galvanized Iron.

From R. R., *Enfield, N. H.*—Please inform me through *The Metal Worker* what the standard weights of different numbers of galvanized iron are; also if the weights have been changed within a year.

Answer.—On July 1 last a standard gauge of galvanized iron was adopted, being based on the United States standard gauge for sheet iron and steel, as approved March 3, 1893, and which came into effect July 1. The basis of the new gauge is so many ounces per square foot of metal, and the galvanized iron gauge is 2½ ounces per square foot heavier than the black iron gauge. The following are the gauges of galvanized iron and their weights from Nos. 15 to 30 inclusive:

Gauge No.	Ounces per square foot.
15	47½
16	42½
17	38½
18	34½
19	30½
20	26½
21	24½
22	22½
23	20½
24	18½
25	16½
26	14½
27	13½
28	12½
29	11½
30	10½

Dead Black Finish.

From E. E. H., *Fairbury, Neb.*—Will *The Metal Worker* or some of its readers tell me how the dead black finish is made that is found on wrought iron fire sets?

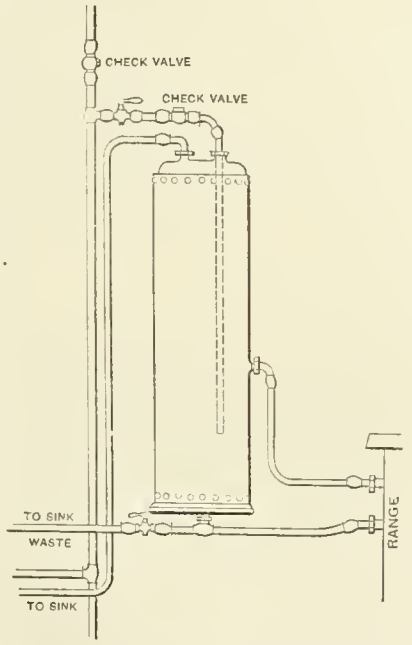
Note.—If any of our readers are doing such work the method they use will make an interesting contribution to the Letter Box. From one of the workshop receipt books we take the following, which is said to give a dead black finish: "Dissolve seed lac in 95 per cent. alcohol q. s., mix refined lamp black with alcohol and add enough seed lac varnish to make the lamp black adhere, but not enough to give it a gloss. Strain through cheese cloth. Apply with a soft varnish brush."

Pipes From Tank.

From R. D., *New York.*—I would like to offer a suggestion to "M. T. C.," who reported his difficulty with overflow pipe from tank in *The Metal Worker* of December 23. If he will put in a tee and nipple at D, all the same size as overflow, and extend the nipple a few inches above tank, this arrangement will make it work every time. If the water should flow freely to the overflow—that is, to fill the full bore of the pipe—doubtless some air would get trapped and perhaps stop the flow, but it would be only temporarily, as the air would soon find its way to the surface and the flow again be established.

Water Backs Burst Repeatedly.

From T. J. K., *Brooklyn, N. Y.*—About four years ago I set nine ranges in three three-story single flat houses in this city, which were connected to boilers, &c., by a plumber engaged by the owner of the building. The ranges were in use about six months when one of the water backs burst, cut clean in



Water Backs Burst Repeatedly.

two, and breaking the end of the range. I put in a new end and water back, and about two months after the same back burst again. One year after another burst, and last week, nearly four years later, another one, all being on the middle floor. I claim it is due to some fault of the plumbing, but to satisfy the owner, who thinks the fault is with the water back, I refer the question to you. I send you a sketch of the range, boiler and connections. The cold water supply runs from the main in the cellar in a single line to the top floor, which is the third story. On the second floor in each house there is a check valve in the cold water branch, between the stop cock and the boiler, and on the top floors the valve is in the main line, about 24 inches above the sinks. When the houses were finished it was found that there was not enough pressure at times to force water to the top floors, so a pump was put in on the top floor of each house, and a check valve put on the main line on the second floors above the boiler, to prevent, as the plumber said, the family on the top floor from drawing water from the boiler on the second floor. About one month after the pumps were put in there was a new main laid in the street, and they now have pressure enough and do not use the pumps But the check valves were not removed and are still in the pipes. The plumbing work is the same on each floor, except that there are no check valves on the first floor. The water backs that burst were on the second floor and did not burst with any great force, such as would occur if the supply pipe were frozen, but simply split in two, breaking the end of the range next to the back.

Answer.—We agree with our correspondent that the arrangement of the plumbing work has more to do with the bursting of the water backs than a lack of strength in the water backs themselves Steam is the probable cause of the water backs bursting in the case mentioned. If it were the direct cause the explosion would have been with such force as to make the results disastrous. We are inclined to think that there was a cessation in the supply of water to the water back, or if not an entire cessation, a very greatly reduced pressure. Under such circumstances steam would generate in the water back to a greater or less extent. The condensation of this steam would create a vacuum and the inrush of water filling the space would strike a blow, the force of which has not been accurately determined to the satisfaction of engineers who have considered the subject, but is sufficient to split a water back. The arrangement of the check valve and stop cock so close together at the top of the boiler would naturally reduce the size of the waterway and increase the friction at that point. Any generation of steam in the water back would create a back pressure, which would close the check valve and stop the supply for the time being. If the stop cock were located at a different point, so as not to reduce the waterway, and the check valve entirely removed, we think a material relief would be given. If the stop cock must be placed at this point, one should be used which will give a waterway the full size of the bore of the water pipe.

Finding a Radius.

From SNIPS, *East Hampton, N. Y.*—Very frequently we of the craft have to get at the radius of a circle of odd numbers and odd fractional parts, as $17\frac{3}{8}$, $7\frac{3}{8}$ and $21\frac{7}{8}$. I have an easy way to get the half of the above numbers, which is to take one-half of the next smaller even numbers, in these cases 16, 6 and 20, which we find to be 8, 3 and 10, respectively. Then add the numerator and denominator of the fraction together for a new numerator and double the denominator, which in these cases are $\frac{3}{32}$, $\frac{11}{16}$ and $\frac{15}{16}$, respectively, and added to the even numbers give $8\frac{3}{32}$, $3\frac{11}{16}$ and $10\frac{15}{16}$ as the radii.

Fails to Heat First Floor.

From J. B. O., *Baltimore, Md.*—In answer to "A. G. D., in *The Metal Worker* of January 20, who asks for information about a fire place heater, it is not every kind of heater that will successfully heat the rooms as described, and especially when arranged in the chimney flue as stated. I take it, there is no fire place in the parlor. If that is so, the right thing to do would be to put the register in the parlor near the ceiling, with the cut off above, as mentioned. Then make a duct through the washboard 2 or 2½ x 6 inches into the flue directly back of the stove. By that means a circulation of atmosphere will take place in the parlor, exhausting the cold air and furnishing a continuous supply of warm air.

Rattling Noise in Boiler.

From R. L. M., *Hamilton, Va.*—In the issue of January 27 I note what "Subscriber" says about rattling noise in boiler. I had the same experience with the first boiler I ever put in. I had a range and a 40 gallon boiler. Water back was tapped for ¾ inch pipe, and I made the whole connection with ¾ inch iron pipe. It worked well for a while, and then began to rumble in such a manner as to frighten the occupants into pulling the fire out at times. I found the upper elbow, next to the water back, partially closed with a substance similar to calcined plaster, which I supposed was due to lime in the well water. I substituted 1-inch pipes from the water back to the boiler and have had no trouble since.

Fails to Bake on the Bottom

From STOVE DEALER *Port Henry, N. Y.*—I have had the same trouble as reported by "W. S.," in *The Metal Worker* of January 20. I have had it in connection with a two flue range and a chimney with a strong draft. The partitions making the flues do not run far enough front, consequently the flame and hot gases make a short circuit, leaving the front, or left end as you face the oven, comparatively cold, while the back or right end will be "sissing" hot by the up-flue. I have remedied the cases that I had by lengthening the flue strip, taking a piece of sheet iron the width of the flue strip, cutting two notches in it and crowding onto the flue strip, leaving a space of about 5 inches (in one case 3½) between end of strip and front plates of oven. I generally cut the strips slanting toward the bottom at one end rather than square. I have always succeeded in making the ranges work to the satisfaction of parties having them.

From J. B. O., *Baltimore, Md.*—In answer to the question of "W. S.," Guelph, Ontario, in the Letter Box of January 20, I suggest: Perhaps the flues of the stove that would not bake on the bottom were so large that the products of combustion passed through them too rapidly to heat the bottom oven plate. In that case it would be necessary to put a damper in the smoke pipe in order to have better control of the chimney draft. I have found this to be the case in many instances in my experience, both with stoves and ranges. We are too apt to jump at the conclusion that it is for lack of draft, when in fact there is a superabundance. Then, again, the stove that would not bake might have required a smaller pipe than the other stove that did bake. The one was made, say for a 5 inch pipe and that pipe was put through a 6-inch pipe hole without proper adjustment; the other stove adapted for a 6-inch pipe and put into a 6 inch pipe hole. Nine times out of ten the latter will bake and the former fail. All stoves require proper pipe.

Note.—We cannot agree with our contributor in his conclusion that the draft at times is too strong when there is a good body of live coals in the fire chamber. Under such conditions the air or gases are at the highest temperature immediately on leaving the fire, and the quicker they get to the bottom of the oven the hotter they will make it, and if the current is continuous its rapidity will subject the bottom oven plate to a greater heat rather than interfere with its being heated, for less heat will be lost in transit. A temperature over 350° is seldom required in an oven, and the temperature of the products of combustion from a fire under the influence of a rapid draft of air through it will often be three times as high. If the draft is slow the fire will not be so hot and the products of combustion will leave at a comparatively low temperature in small quantities, and their movement will be slow, permitting greater loss of heat.

From U. S. R. Co., *Utica, N. Y.*—In answer to "W. S.," whose stoves do not bake on the bottom, our experience is that you only get what you pay for these times, and that stoves half fitted and mounted are not all sure workers, after increasing the draft by larger pipe or topping out chimney. Take the stove apart and remount and putty joints well and the stove will do the work. We have had trouble with stoves under the same conditions as mentioned, and after remounting them put them back in the same house without building up chimney or replacing larger pipe than capacity of collar on stove, and they worked satisfactorily. You seldom hear of first-class stoves working this way, and manufacturers will bear us out in the statement that there are too many cheap goods in the market. This experiment is worth trying, as it is what we have done, and we speak from experience.

From H. C. S., *Kenosha, Wis.*—I notice a query from "W. S.," Guelph, Ontario, in your issue of January 20, in regard to the slow baking of some ranges or stoves on the bottom, while others will work perfectly in the same place. Of course, it goes without saying that when an exchange of that kind is made it is very seldom that the same make of range is used. We usually put in some range that has been thoroughly tried and that we are sure of, or we must experience the same trouble. I find that many times ranges with a bottom oven rack are addicted to this trouble. Take the rack out entirely and your range will bake all right. But the main trouble with this kind of ranges is the pipe collar or smoke outlet of range. Many manufacturers, mostly in the East, provide too small a pipe collar. When a high chimney, such as in large cities, gives an extraordinary velocity to the smoke, the small pipe collar will do, and, moreover, adds to the saving of fuel, but in smaller cities or towns, where the draft is slower, owing to a lower chimney, these ranges will always be bothersome. My motto is never to sell a range with a small pipe collar to parties who use a short chimney. Give them a range with sufficient size of smoke outlet to create draft without hindrance, and give them a sheet flue if possible.

From D. H. B., *Phœnix, Ariz.*—To the inquiry of "W. S.," Guelph, Ontario, I would make the following suggestion: The flues of the ranges are too deep. Try putting ashes or sand 1 or 1½ inches in depth on the bottom plate. When the range gets thoroughly tempered you will have to scrape the sand out a little at a time. Try it.

Electric Gongs.

From D. W. E., *Reading, Pa.*—There is a discussion concerning the best way to hang an electric bell. Should the gong be above the magnet or below it? I should be glad to see the question discussed in the columns of *The Metal Worker.*

Answer.—In order that the vibration in an electric bell may be regulated, it is necessary that it be hung in the position intended by the manufacturers. Formerly the practice was to hang the gongs below the magnet, but this has been superseded by the plan of placing them above the magnet.

A Question of Water Pressure.

From X. K., *New York.*—Please answer the following questions in the Letter Box. Is there any difference of pressure in the three vessels shown, all being of the same hight but of different diameter and shape? Is the tank on the inclosed sketch high enough to force water a distance of 400 feet successfully, the hydrant being 2 feet lower than the bottom of the tank?

Answer.—The sketches have not been reproduced, as the vessels are readily described. The first is 6 inches in diameter and 40 feet high, with a flat bottom and a pressure gauge at the side. The second is 20 feet in diameter, with a flat bottom and the same hight. The third is of the same hight, and 20 feet in diameter until it reaches a point 10 feet from the bottom, where it begins to taper to a ½-inch pipe, to which the pressure gauge is attached at the bottom. In answer to this question, the gauge would register the same pressure in each case. The pressure of water at a given point is equal in every direction, and depends on the hight of the water above it and not upon the quantity in the vessel or its shape. A thumb rule for calculating pressure is to allow ½ pound pressure for each foot of water in hight, which is slightly in excess of the true pressure. The second sketch shows a round 20-barrel tank, located 400 feet from a hydrant, the outlet of which is 2 feet lower than the bottom of the tank, and connected with it by a 1-inch galvanized iron pipe. A 20 barrel tank would hold about 700

gallons, and would necessarily be about 5 feet in diameter and 5 feet high. When the tank is half full the water level would be 4½ feet above the hydrant outlet, giving a pressure of about 2 pounds to overcome the friction in traveling through the long pipe and force water out. This would not cause a rapid discharge of water, and might not be sufficient, so that raising the tank or enlarging the pipe would be necessary to increase the supply. Some information relating to the last question will be found in *The Metal Worker* of September 30, 1893

Ventilation.

From VENTILATION. — The article in your issue of January 13 in regard to heating and ventilating is timely. No doubt, in the near future, electricity will be employed for heating our buildings, as it is now utilized for lighting them. But the question of ventilation will remain a vital one, just as it is at present. It is astonishing how greatly it is neglected. Most of our public buildings are put up in total disregard of the entire subject. We went into a woman's club house in a Western city, the other day, and at the dedication the president congratulated the members on the fact that they had secured a perfect system of ventilation. We happened to converse with the builder in regard to it, when we were told that the ventilating flues simply extended to the attic, and that the attic was a closed room having no connection with the outside. You can judge how much ventilation that building had.

A great many people fancy that ventilation is a profound science. There is nothing mysterious about it at all. The law is simply that every human being needs 2000 cubic feet of fresh air per hour. When he does not get it he suffers. Now, the sole problem is to admit this amount of air and to take it out when vitiated. It can be done by means of flues, without any fans or machinery. I have seen at least one public building constructed in this way. This is the Greeley School of Peoria, Ill. I don't know who was the builder or the architect, but the plan is so exceedingly simple that it deserves commendation, because it is accomplished without the aid of fans or machinery, and it seems to me anybody could do it, because all there is to it is a system of flues What is there to ventilation after all but the science of building a flue large enough to admit the necessary amount of air, and building another flue large enough to take out the bad air, and what sense is there in building tight boxes, such as are in use in most of our cities ?

It appears to me that a matter so simple and at the same time of such vital importance should be settled by law. No public building designed for the accommodation of people, no court room, opera house, school or church should be constructed without providing for this matter of ventilation. We regulate now their construction in one particular, that all doors must swing outward. Why should we not with equal justice provide that they should furnish not only means of easy egress, but also supply plenty of fresh air to the public who patronize them ? There is no patent on this plan, and it does not interfere with any one's right, and it does not prevent public competition, but it would simply lay down plain and general rules that every architect and builder must follow. It does not take a costly system of fans or machinery to do it. It simply provides that the architect must consider this subject when he plans the building and not leave it until afterward as an extra.

Origin of Tariff.

From E. P., *Baltimore, Md* — Being a maker of tinware and consequently interested in the Wilson bill and its bearing on the tin plate duty, the word "tariff" has been a prominent one in my course of reading for the last month or more. Can you tell me through the Letter Box what is the actual meaning and origin of the word ?

Answer. — According to Webster, "tariff" is "a schedule system, or scheme of duties imposed by the government of a country upon goods imported or exported;" or "any schedule or system of rates, charges, &c." Its origin is believed to be the name of a Moorish chief—Tareef—who, possessing a fort on the Spanish coast near Gibraltar, was accustomed to levy toll on vessels passing through the straits. His toll became an understood thing, and the amount was always added to the price of the goods.

Fire insurance companies have not experienced a profitable business of late years, and fire insurance stocks are, with but few exceptions, not regarded in the same favorable light by investors as was formerly the case. A statement printed by the New York *Journal of Commerce and Commercial Bulletin* shows that only 29 fire insurance companies are now on the stock list, whereas their number in 1879 was 80. The majority of these latter have in the interval terminated their existence through failure. And yet, with this great weeding out, the existing companies as a rule show a material shrinkage of profits as compared with their returns of 15 years ago. The enormous increase in the fire losses of the United States in recent years is, of course, mainly accountable for this state of affairs. Fire underwriters complain, however, that, as compared with those of other corporations, their tax charges of all kinds are entirely disproportionate and unduly heavy.

A marked revival of activity in real estate is reported in New York and Brooklyn. Several important purchases of city property have been consummated within the past week, and there has been a considerable increase in the number of plans for new buildings and alterations filed with the Building Department of both cities. Among the contracts for costly buildings to be erected in New York during the year is a $1,000,000 structure up town for the United Presbyterian Society, and a number of other erections only a little less important.

A significant indication of reviving confidence and prosperity is seen in the reassuring reports of the condition of the dry goods trade throughout the country. The *Dry Goods Economist*, which has been making a canvass of all the large dealers, states that most gratifying reports have been received from every quarter. A large, healthy spring trade is looked for.

Management of Men and Manufacturing Industries and Hints on Labor's Problem.

Recognition of and Kindness to Employees.

BY THOS. D. WEST.

It would be very difficult for any court to find, by trial, many manufacturers who could not prove that in the erection and management of their plant more or less consideration was given and money expended for the welfare and comfort of their employees.

Thousands of dollars have been expended by firms in equipping plants with good ventilation, light, sanitary conveniences and almost every kind of device that modern appliances can offer to make cheerful, comfortable and convenient work shops. In nine cases out of ten the employees are more likely to abuse or ill use the privileges than to give the employer any credit for his kind consideration. The majority will insist that such improvements were not given with the view of making the workman's lot any more cheerful or lighter to bear, but solely because a larger and better return in work or profit would be expected.

We admit that it is conducive to that end, but not to the degree which workmen generally insist it is, and if it were the purport of this article to prove it we would have very little difficulty in doing so; but knowing as we do that there are employers who do consider the welfare of their men in the construction of buildings and improvements, and in the majority of cases only get abuse for it, we will endeavor if possible to ferret out the cause for this lack of appreciation on the part of the employees.

Fortunately, or unfortunately, it has been my lot to know from experience the true feelings, thoughts and ideas which workmen possess when they stand on a low plane, because the writer started at the age of ten to assist in making bloated bond holders, supporting non-producers in luxury, creating the wealth of the world, &c.

Our whole trouble is due to not thoroughly understanding and retrying each other's side of the question. Employers might go on and furnish a free banquet for dinner every day, have reclining chairs for an hour's noon "nap," take their men home in a four in hand every night, and at the close of the year divide the dividends, if any, among their men and still fail to have them contented. Why ? Simply because they would still believe that the employer had the "lion's share."

Little does the man who has never been a "commoner" know of or realize the true feelings and ideas of a workman who has false ambition and looks from a low level at an employer through the lens of ignorance.

They never look at millionaires and think that when they do have a banquet three times a day, dress well and have the best of the land, nearly every cent they pay for it is returned to labor, giving employment to thousands of people, and that at the end of life they leave all their wealth to continue being beneficial to mankind. They never stop to think about the labor of the world that is employed in manufacturing luxuries, furnishing amusement, &c., although they are not elements really necessary for the maintenance of life.

Every man who has a small bank account is a capitalist; and the more of

such there are the less is the tendency of or opportunity for massing wealth in the hands of a few. If labor desires a more even distribution of wealth there is but one sure way of obtaining it. and that is, strive by industry and "ability" to secure it. If you cannot be a "big fish in the puddle," you can be a little one, and thus assist in creating a more even distribution of the country's wealth, which labor is calling for.

It is only against the miser or hoarder who will not invest his wealth that labor should always be "bucking." Such are its real enemies.

"That's all right," says some one a little higher up the ladder who does not want to labor any more or is too lazy to do so; "we recognize all you say to be true, but we still object to the unjust division of wealth. Our stock in it should be larger. We do not object to purchasing more of life's luxuries, and also becoming beneficial in order to assist in furnishing employment to labor."

Now, upon the answer to such logic hinges some solution of the problem. It is not the purport of this article to show all of the ins and outs of the subject. Suffice it to say that the manufacturers and all well informed men of to-day know that three-fourths of American wealthy business men are self made, and that there is nothing to prevent any man who has brains, who will put an end to drinking, idleness and giving more time to other people's business than his own, from rising and becoming an employer of men, and perhaps a millionaire. We also know that if to-day all the wealth of the world were equally divided, the lack of self denial and power to hold money and manage it would in an astonishingly short space of time place it again in the hands of those possessing energy, brains and ability. These are the three elements that to-day are most necessary to be discussed and thoroughly illustrated by employers in a manner to be recognized by the employee before he is going to be able to intelligently appreciate kindness or respect ability and recognize such as of value. It is the weight of responsibility that often loads down well to do business men or millionaires so heavily that it makes it impossible for them to take any pleasure out of life.

The time is here when it behooves all employers to take an interest in any element that can tend to enlighten and prove to the employee concerning the responsibilities and care carried by a manager, boss or business man, and the ability required for success in any enterprise. The majority of workmen think that money is the only element required to make money, and that if they could control a few thousands they would soon be rolling in wealth. Brains or ability with them are a secondary consideration. Their knowledge of their power and of their necessity are very limited. Their maxim is more, "any brainless dude having money can make money." A workman's conception of capitalists and business men is strengthened and verified in many erroneous, deceptive ways that could be exposed.

One great factor lost sight of is the sincerity of a workman's ideas and opinions. Many think their actions are chiefly inspired by prejudice, by a desire for spite or by a love for destruction of property. This is where many are mistaken. Workmen are sincere and conscientiously think they are right and honestly justified in worrying and "bucking" an employer to their full power. "He is an enemy robbing us of our just share in the wealth of the world. Down with him!" is the cry. And the majority feel and mean every word of it. Some effort must be made to guide them aright in understanding the principles in political economy that adjust and award wealth to man, and counteract those who for self gain lead them to error.

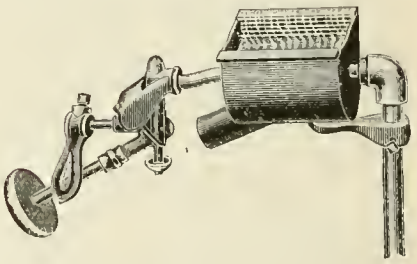
The manufacturer and employers of labor have too long permitted the buncombe politician, lawyer and theorists to mislead labor in direct opposition to its own interest. We have had nearly all kinds of "ages" but the practical age, and that is now drawing in upon us with a brilliancy that cannot but enlighten and make the world better for its appearance. There will come a recognition and development of brains, ability and energy by all classes. It will call out and support practical literature, discussing past errors. Ability must prevail in order to maintain civilization and do justice to all in a much more satisfactory degree than is done to-day, and the sooner employers and experienced, practical men take a hold of this—the duty that awaits them—so much nearer are we to seeing the bars taken down which to-day so unjustly separate labor and capital. Capital is to blame, like labor, in many ways for the strife existing between them. One of its errors is that it holds aloof too much from labor. Employers must endeavor to get into closer contact with their employees, and, instead of only spending $10,000 for shop conveniences for the benefit of employees, and then passing them by on the street with a recognition cold enough to chill the blood before the vibrations of "how de do" can reach their ears. Try stopping to cheerfully inquire after their welfare, and ask if there is not a good word you might be able to put in for them somewhere. Learn if in going to buy that little piece of property they are going right about it. Make sure that no sharks have them in tow, and if they have sickness at home let them realize that you sincerely sympathize and can be relied upon as a friend in need should the services of such be required. Don't be in any hurry to leave them. Let them tell their troubles in their own way and advise them the best you can, leaving them with the instruction to call upon you any time they might want advice or assistance. Such courtesy and treatment does not involve any sacrifice of control or independence in your management of men as employees, and if you have never tried it, do so with a few of your worthy employees, and if the writer's experience would lead him to predict results, it would be that half a dozen such made friends would be of more value around your plant than any two or three thousand dollars that might be invested in conveniences for the benefit of employees.

As an employer striving to secure recognition for kindness and consideration from men while engaged in labor, your kindest acts and thoughts will often be misconstrued as for self gain. As an individual outside of your works, wholly disinterested in what a man may be doing, you can by warming up to those worthy of your respect and attention make friends of workmen who would follow you through thick and thin. "Warm up" to those you can and they will take care of the bilious, prejudiced cranks and would be bosses for you and assist them in making their existence still more miserable if they insist on fighting against common sense justice and making themselves disagreeable.

Of course an employer cannot create appreciation or respect for his good will in one day. He has got to await developments for opportunities when kindness and substantial assistance can in a kind, dignified manner be tendered. But when you have gained the confidence of your employees you are in a position to make a confidant of them when adversities or hard times come to you. When it is absolutely necessary that less wages must be paid in order to meet the market or procure work, you can generally count upon your men accepting it with a grace you cannot mistake, as complimentary to the confidence they repose in you as an employer. Never forget that it is a poor rule that will not work two ways, and that when you can command a fair price for products, and business is good, be not too slow in raising their wages, especially to those possessing energy, brains and ability.

Hull's Double Soldering Furnace Burner.

The accompanying cut illustrates a double soldering furnace burner newly invented by M. L Hull, 24 Broadway, Cleveland, Ohio. It is 3½ inches long



Hull's Double Soldering Furnace Burner.

and quite wide, as the illustration shows. The flame strikes inward from both sides, heating the iron on either side and the bottom at the same time. The heat is said to be very intense and but little fuel is required, the statement being made that but two quarts of gasoline per day will heat ordinary coppers for use. The fire burns through sawed slots at the side and a sawed slot in the bottom under the feed pipe to generate the gas. It is pointed out that owing to this construction no drops of solder can plug the burner. It is economical of heat, as the frame will be so constructed that when the first copper is taken out the second one will roll down and take its place.

A large number of riotous miners consisting of Huns, Slavs, Italians and Frenchmen, created a reign of terror in Allegheny County, Pa., on Saturday by burning and demolishing the works at several collieries, committing theft and arson in Bridgeville and the neighboring towns, and attacking the mine operators. A serious amount of damage was done and blood was spilled before the riot was quelled by force of arms.

The United Collieries Company, a Western Pennsylvania corporation, have instructed their counsel to bring suit against the Pennsylvania Railroad Company for $300,000 damages for alleged unjust discrimination in freight rates and for violating the Interstate Commerce law.

TIN PLATES.

Tin Mill Practice.

Considering the authenticated fact that nearly $5,000,000 have already been invested in the tin plate industry of the United States, and the additional fact that several new plants are now in process of construction, it is about time to look for some important improvements over imported methods used in the manufacture of this staple commodity.

During the introduction of the industry Americans have been almost entirely dependent upon the brains and ingenuity of foreigners for best results. Agents have been sent to Wales to become familiar with best methods and have visited Welsh manufacturers to make direct purchases of machinery. In several instances this machinery has been set up in American workshops, but never used, except as a model for American mechanics to improve upon. Now that the industry has been established on a good footing and is in danger of being injured by adverse national legislation, Americans will, according to precedent and in the exercise of their natural instincts, use their own brains and ingenuity to organize systems of working and invent machinery and appliances to reduce the cost of production to a minimum, so as to compete successfully with imported products of cheap labor.

Secrecy regarding processes and machinery is almost a hobby in some branches of industry among the British, and secrets are only transferred from one to another after a long term of apprenticeship. In this country it is a more difficult matter to keep such secrets. Young men want to know, and if not told will find out, manufacturers exchange ideas more freely and mutual advantages are enjoyed. Such a course of action is necessary to build up the new and important tin plate industry.

Improvements which have been made public up to date pertain mostly to minor details of pickling machines or tinning pots, and in some instances noticeable changes have been made, the importance and value of which is not yet definitely determined. Among other inventions coming under the latter classification is a new design of annealing furnace, which is constructed upon a plan entirely different from old styles.

Vertical Annealing Furnaces.—Fig. 1 represents a vertical section of the proposed furnace and building suitable for its operation. The intention is to dispense with the old method of charging and drawing annealing boxes horizontally through doors at the side of the furnace and substitute a method of charging the furnace vertically, by mechanical means instead of manual labor. In the former method at least six men are required, and their work is arduous in character. Men need to be expert in handling boxes by means of a lever truck, and must become accustomed to work in close proximity to high temperatures. In the method suggested, loaded boxes and standa or bottom plates may be moved easily by two men to and from any part of the annealing house, the means used being an inexpensive hand power traveling crane, not necessarily of a capacity exceeding 3 tons. This crane, which is

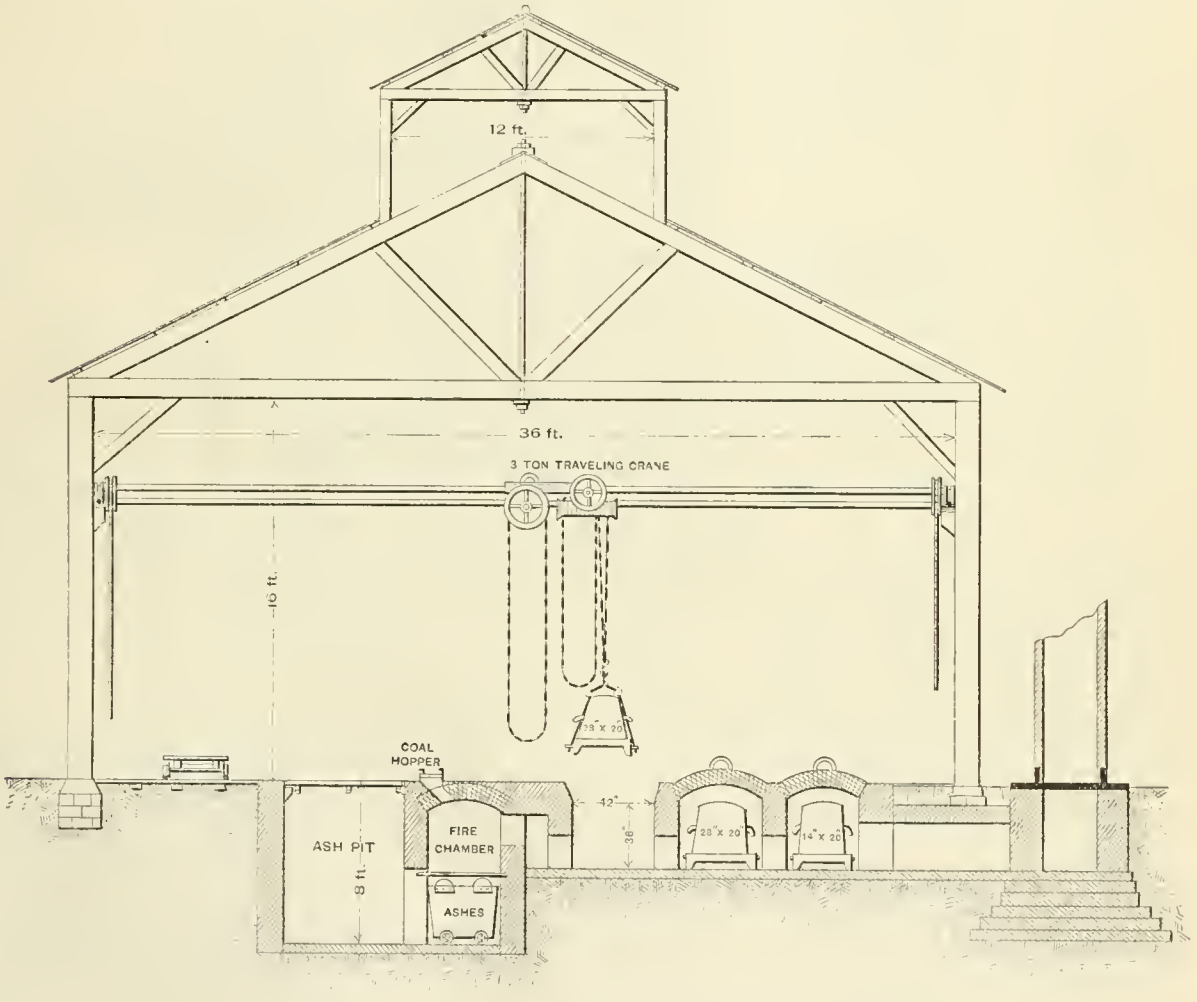


Fig. 1.—Sectional View through Building.

VERTICAL ANNEALING FURNACE PLANT.

illustrated in Fig. 1, though not in detail, is constructed to act quickly and steadily, moving boxes without disturbing their contents. The racking gear moves the carriage of the crane to right or left on the beam, and by a similar contrivance the whole device is moved from one end of the building to the other.

Before describing the furnace it is necessary to state that, for the effective operation of the system, it is suggested that the bottom plates be loaded while in position upon the truck shown in the illustration. After the cover is placed over the pile of plates to be annealed the whole arrangement is transported from the shears, or opener's bench, to the annealing house, and is ready to be picked up by the traveling crane and charged into the furnace.

It will be noticed that there is no obstruction above the floor of the annealing house to interfere with the operation of the traveling crane. The furnace is built below ground, and heat which would otherwise be wasted is retained.

Method of Firing.—The fire chamber is novel in construction, being fired from the top, through a cast iron hopper placed in such a position as to conduct the fuel to the center of the fire. This hopper might also be constructed so as to be placed in the center of the arch and form part of the key. To agitate the fire on the grate bars, without descending the ash pit, a rocking grate is suggested, the lever extending above the floor level. The ashes falling from the grate are caught in the iron wagon shown in the drawing, which is removed by means of the traveling crane to the railroad track, and afterward taken to the dumping ground outside the building. No dust arises and the method is cleanly. The ash pit, which measures only 4 x 5 feet, can easily be kept covered after ashes are removed.

Charging Furnaces.—The manner of charging the furnace is as follows: There are three heating chambers, the size of which must be regulated by the size of bottom plates used. When the boxes are placed in the chambers to be annealed the sections of arches shown in Figs. 2 and 3 are placed in position, a little fire clay dope is used to fill the crevices and the furnace is ready for operation. In Figs. 2 and 3, referred to, the construction of these arch sections, which form the roof of the furnace, is illustrated in detail. The frame is made of cast iron with a hook inserted by which the arch is lifted. Next to the top of the frame a layer of asbestos packing is placed. This acts as a non-conductor, and as the furnace is not at any time heated above 1750° F., workmen will not be troubled with the heat.

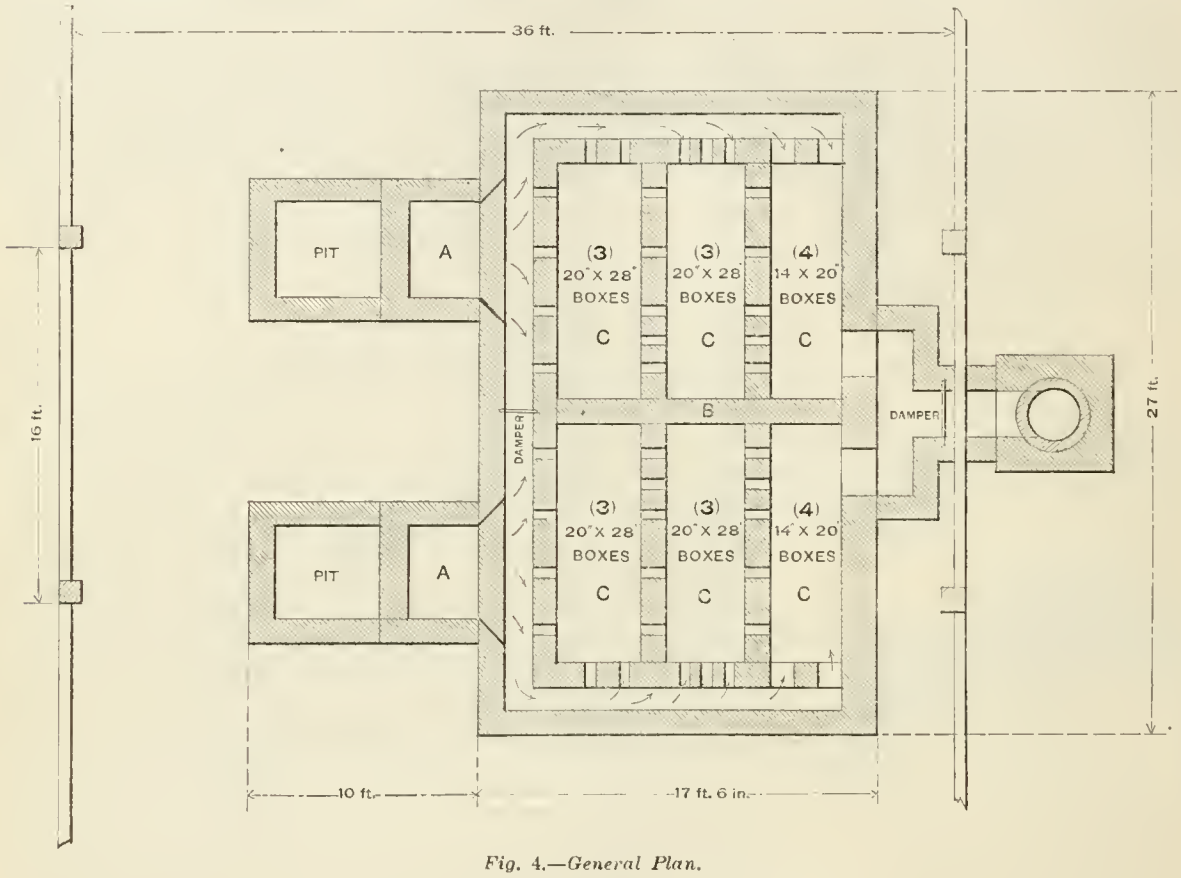


Fig. 4.—General Plan.

VERTICAL ANNEALING FURNACE PLANT.

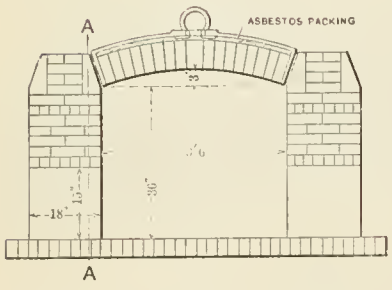


Fig. 2.—Section Showing Asbestos Lined Arch.

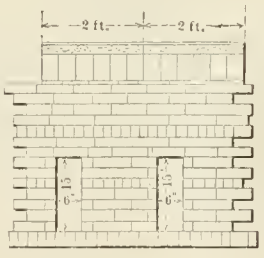


Fig. 3.—Section A A, Fig. 2.

VERTICAL ANNEALING FURNACE FOR SHEETS.

In the illustration, Fig. 1, the two chambers nearest the smoke stack are shown covered, with annealing boxes in position. In the chamber nearest to fire the arch is removed, showing annealing box suspended in process of charging. From the description given and illustrations referred to the general idea of the system will be readily understood.

General Plan.—In order to effect economy in construction for a given capacity, also to economize space and fuel, this furnace is designed double, having two fire chambers, A, Fig. 4, and a dividing wall, B. The two parts of the furnace may be worked together or separately, and two different temperatures maintained. This is effected by proper use of the dampers, one placed between the two fire chambers and the other near the smoke stack.

In the construction of this furnace great attention has been paid to securing a perfect distribution of heat, and the heat conducting passages and ports are so graded that it is possible to concentrate or decrease the heat at any desired point at the will of the person in charge. The two divisions of the furnace may be varied in temperature, as previously stated, or any part of the furnace may be worked hot, cold or at an even temperature. To accomplish

this, it is only necessary to place loose fire brick in any of the ports where it is required to cut off heat.

Around three sides of the six heating chambers C there is a passage 3 inches wide along which the flames and heated gases travel, entering the heating chambers through ports shown in the inside walls and indicated by arrow marks, which also describe the course of flames from the chamber. It will be noticed that these ports are graded in size and number, the object of which is to produce a perfect distribution of heat throughout the furnace. For this effect, the ports near to the smoke stack are made either larger or more numerous than near to the fire chambers.

All ports are placed at base of heating chambers, the natural course of flames and heated gases being to follow the arches, thus insuring an equal distribution of heat at base and top of annealing boxes, consequently there is a uniform result in ductility and color of sheets. The flames and heated gases passing from the fire chambers are conducted near the bottom of heating chambers, thus insuring a perfect heat.

The capacity of heating chambers, as shown in plan, is 20 boxes. The large sizes, requiring most heat, are placed in the chambers nearest the fire and the small sizes in the chambers nearest to smoke stack.

Points of Economy.—The first and last object of the inventor of this furnace was to economize labor and fuel without doing so at the expense of quality. In tin plate works of small capacity the effect would not be as noticeable as in a large plant. Yet it would, from the writer's point of view at least, save an amount of money equal to the superintendent's salary, if not considerably more. If only one small furnace of this design is used a system of overhead "telegraphs" is suggested from which pulley blocks, quick acting and steady, are suspended. This would not be as costly as the traveling crane, nor quite as effective. For large plants the traveling crane, which will serve either one or twenty furnaces, should be used. It is in the method of handling black plates from the sheers to the annealing house that the first saving is effected. There is no intermediate handling between the opener and the cold rolls, as the plates need not be disturbed until the latter point is reached, and so on through each process to the tinning house similar saving in labor is effected.

In the construction of the furnace but few castings are necessary and very little wrought iron work. The excavation need only be 4 feet deep, except at the ash pit, and the total hight of brick work is represented by the same figure. If the ground is packed tightly around the furnace and a good quality of fire brick used, repairs on the furnace will be very slight, and if packed with clay, the whole mass on the outside walls will bake solid. For a similar capacity of annealing boxes the cost of building this furnace is less than the old style.

On the point of cleanliness and keeping plates free from grit the method recommends itself, as the contents of boxes are not exposed in the dust and dirt of an annealing house.

In regard to fuel, the furnace will burn slack coal. The grate area of each fire chamber is 12 square feet, and is sufficient for 20 boxes. All heat is contained in the furnace, regulated at will, and not allowed to escape and heat the air. Hence the economy.

The foregoing description and illustrations of a recently invented furnace for annealing black plates in tin mills have now for the first time been published to the trade and are open for criticism. The columns of *The Metal Worker* are open to all who wish to avail themselves of opportunities to criticise existing methods or exchange ideas with other members of the trade, always with a view to placing the new American tin plate industry upon a footing that will enable it to compete successfully with the world.

SCRAP.

The United States Iron & Tin Plate Mfg. Company, Demmler, Pa., manufacturers of tin and terne plate, are operating their plant to full capacity and are disposing of their product about as fast as made. Right through the long period of business depression the above concern have been able by reason of demand of their customers to keep their tin plate plant in operation to nearly full capacity.

The Philadelphia Tin Plate Company is the name of a new concern recently established at Eighteenth street and Washington avenue, Philadelphia. They have put in a plant consisting of three Phillips' improved tinning machines, and will make additions as their business grows. They are at present making both bright and roofing plates, but propose shortly to add to their line an extra coated plate. They are conveniently located for business and start out in good shape. In a circular just issued to the trade they say: "Our purpose is to make plates of a standard grade, and not to sacrifice the quality for a slight saving in cost of manufacture."

The Duquesne Tin Plate Works, Soho, Pittsburgh, Pa., are reported as running double turn with a full force of work people, having sufficient orders on hand to keep the plant busy for some weeks.

The Black Diamond Tin Plate Works, Philadelphia, are reported in operation, turning out both bright and terne plates. Temple & Lockwood, 12 Platt street, New York, are their agents in this city.

James B. Scott & Co., Pittsburgh, Pa., send out a circular directing particular attention to Scott's Extra Coated and Triumph old style American roofing tin plate of their manufacture. This firm are sole factors for the Blairaville Rolling Mill & Tin Plate Company. Under the class of American roofing tin they refer to Duquesne and Neville brands, while notice is likewise made of the following bright tin plates of their manufacture: Blairaville Best Bright, Clifton and Conemaugh. All of the plates are briefly described. Among other things the circular announces: "Our brands are the product of a complete American plant consisting of hot and cold rolling mills, heating and annealing furnaces, pickling machine and tin houses."

Merchant & Co., Incorporated, Philadelphia, Pa., send out small circulars calling attention to their continuous tin for roofing, which is described as well coated. Each sheet is 8 feet long and the rolls contain 100 square feet.

Since the McKinley duty on pig tin went into effect seven months ago about 1376 tons of the metal have been landed in the United States, the greater portion of which remains in bond. There are afloat for this country 935 tons. Shipments of tin from the Straits during January aggregated 3925 tons, against 4000 tons during the corresponding month of last year. This includes 2675 tons to Great Britain and America and 1250 tons to Continental Europe.

"Penny-in-the-Slot" Gas Meters.

The "penny-in-the-slot" gas meters recently introduced in England do not appear to have worked uniformly to advantage, judging from the recent remarks of Vulcan in the London *Ironmonger*. He says: Like some other automatic machines, the "penny in-the-slot" gas meter is not without its faults. A well-known Lancashire justice thought he would like to see how one would work, and deposited a penny in the slot, but the meter—perhaps out of "pure cussedness"—would not act until three other pennies had been placed in its interior. These meters can be generous when they like. Witness one in the house of a poor widow which, for the payment of 1 penny, permitted the user to have gas to the value of 3 shillings and 6 pence. There was an unfortunate sequel to this experience, however, as the gas company demanded payment for the excess, and the widow being too poor to pay steps were taken to sell her furniture. In some towns difficulties of this kind are overcome by the gas department requiring the consumer to make a deposit of £1 or get the guarantee of a responsible householder. The drawback to this is that it drives people of poor circumstances to use oil lamps. Evidently there is room for improvement in the construction of automatic meters.

A meeting of the stockholders of the American Wringer Company was held at Woonsocket, R. I., on the 23d ult., at which Joseph Banigan was reelected president, George Reuter, Jr., treasurer and general manager, and Walter S. Ballou, secretary. The annual report of the treasurer showed the net earnings for the year 1893 to have been $202,011.37; dividends paid, $95,750; leaving a surplus of $106,261 37 for the year, with a total surplus of $238,860.63.

The Haish Manual Training School, at University Place, a suburb of Lincoln, Neb., was burnt down on January 29. The building was an adjunct of the Wesleyan University and was a gift from Jacob Haish of De Kalb, Ill., to the Methodists of the State of Nebraska. It was completed two years ago at a cost of over $60,000, and not a cent of insurance was carried. The loss of the building and the valuable machinery it contained is, therefore, complete, and will prove a serious setback to the manual training work of the university.

Aluminum cooking utensils are beginning to make their appearance in the up-town store windows in New York City.

S. Theodore Mertwage, naval *attaché* to the Russian Legation at Washington, has been visiting Pittsburgh to inspect the manufacture of gun projectiles. It is rumored that the Czar's Government is likely to place some heavy orders for naval supplies in this country before long.

PLUMBING and GAS FITTING.

Domestic Electrical Work.*—IX.

By W. A. W.

Electric Gas Lighting.

Electric gas lighting may be divided into three distinct systems—pendant, automatic and multiple lighting—the latter, however, being used principally in public buildings. Before proceeding to plan the various circuits for lighting gas by the electric spark in a dwelling house, it is a very good plan to thoroughly inform a customer of the various devices on the market, taking time to minutely describe their operation, in order that he may choose intelligently. If these preliminaries were always attended to as they should be there would be less occasion for owners to complainingly remark: "If you had called my attention to this or that device in time I should have liked it much better." This should not be so. By taking the time to inform a customer of every possible convenience at his command profitable sales can frequently be made where least expected.

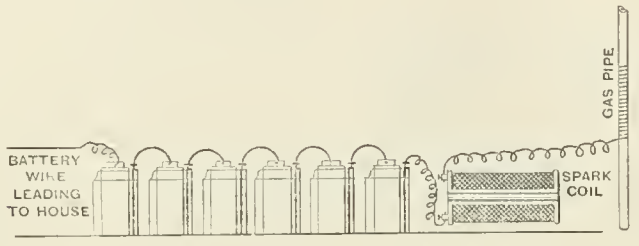


Fig. 17.—Battery and Spark Coil.

In dwelling houses the pendant and automatic systems are used. The pendant system consists of a gas burner having a ratchet and pawl to operate the gas cock, to which is also attached the movable electrode and chain for operating it. At the tip, and in line with the gas flame, is the fixed electrode, insulated from the burner and connected with the battery wire. The gas cock is so arranged that on pulling the chain the gas is turned on; at the same time the wipe spring or movable electrode comes in contact with the platinum point of the fixed electrode, along which it moves with a sliding motion until the end slips off, throwing a spark which ignites the gas. The next pull of the chain turns off the gas. Thus every alternate pull of the chain lights or extinguishes.

The automatic system consist of a burner provided with an electro magnet which operates the cock, turning on the gas and also lighing it at the same instant by simply touching a push button located at any distance from the burner. This feature makes the automatic particularly desirable for halls, basements and bedrooms. By its use a system may be so arranged that a person can visit any portion of the house at night and light the gas ahead and extinguish it in rear of him. For instance, an automatic burner may be placed in the basement, with the push located at the head of the cellar stairway. A person wishing to go down simply touches the button and the gas is turned on and lighted down below; on returning the same operation extinguishes it. In all houses having a hall an automatic should be located downstairs and upstairs, and another in the family chamber. The location of the push buttons should be well studied in order to place them at the most convenient points. No fixed rule can be laid down for this, as the style and arrangement of houses varies indefinitely, and each case must be planned according to its own requirements. The following suggestions, however, are offered in order to give some idea how this may be accomplished: A push button should be located near the front outside door, connected to the burner in hall downstairs, thus enabling a person on entering or leaving the house to light or extinguish the gas from that point. A double push button may be located near the parlor or sitting room door leading into the hall—one button connected with the downstairs burner, the other with the burner upstairs, so that either of these burners is under full control to light or extinguish from this point. A double push button should also be located conveniently near the head of the stairs connected to both of these burners. Another double push should be placed beside the door of the chamber and connected with the burner in the room and also with the upstairs hall burner. Another single push may be placed beside the bed connected with the burner in the room, so that that burner can be lighted or extinguished without rising. Thus it will be seen that a person before getting out of bed can light the gas in his room; on arriving at the door can light the gas in the hall and extinguish that in his room; on arriving at the head of the stairs can light the gas down below; from below he can extinguish the gas upstairs, and leaving the house by the front door a parting touch on the button located there will extinguish the last gas jet. In the same manner a person may enter the house in the dark, lighting his footsteps ahead of him without stopping to turn out the gas and groping his way in the dark to the next point. The number of push buttons connected to a burner may be multiplied to any extent to make the system more convenient.

Nearly all automatic electric gas burners are of similar construction and size, requiring two wires from the push button to burner, one to light and the other to extinguish them. An exception to these, however, is the Triumph single wire automatic. It differs from others in that but one wire is required from push button to burner. This burner is also fully one-third smaller than most others, and requires but a single push button while others require two. Every alternate push on the button lights or extinguishes it. While the automatic burner is almost indispensable where a perfect system is required, yet its use is practically limited to the purpose just described, as its general use in a house, aside from its cost and additional expense for wiring, would be undesirable.

For chandeliers and side lights generally the pendant burner is found the most convenient. In wiring for gas lighting it should be borne in mind that quite a considerable spark is to be kept within bounds, and due caution must therefore be exercised to see that the insulation is perfect where the wires run near any of the gas pipes. All splices should be soldered and covered with rubber tape. The wiring consists principally of what is termed a battery wire, starting from the basement and making a general circuit throughout the house, with branches running to

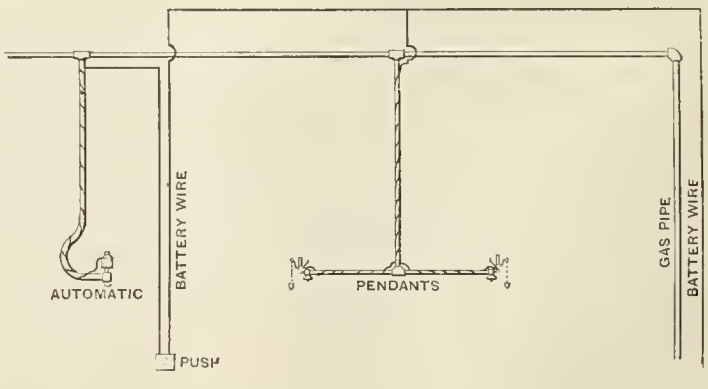


Fig. 18.—Wiring for Electric Gas Lighting.

*Copyrighted, 1893, by David Williams.

each fixture, except in the case of automatics, where the battery wire is run to the push button only.

The apparatus in the cellar consists of the battery (six cells connected in series) and a spark coil. Fig. 17 shows their arrangement. Fig. 18 shows the wiring for two pendants and one automatic burner. The battery wire from the house is connected to one pole of the battery. The other pole of the battery is connected to one binding post of the spark coil. From the other binding post on the spark coil a wire is run and connected to the gas pipe on the house side of the meter. The pipe should be filed bright and clean. About 3 feet of the wire should be scraped clean of the insulation and wrapped tightly around the pipe and soldered. Some advocate bridging over the meter with a wire, but this is all unnecessary, as we have nothing to do with the street side of the meter. The wire being connected with the same system of piping on which are located the burners to be operated, the pipes necessarily act as a return wire and we do not want a ground at all.

Proposed Code Regulating Apprentices.

To the officers and members of the Chicago Master Plumbers' Association and to the officers and members of the Chicago Journeymen Plumbers' Protective and Benevolent Association.

In order to systematize the methods by which apprentices may be regulated your joint committee recommend the adoption of the following :

APPRENTICESHIP CODE.

ARTICLE I.

Section 1. That there be an apprenticeship board composed of two members in good standing of the Master Plumbers' Association and two members in good standing of the Journeymen Plumbers' Association, and that in organizing they shall select as secretary of the board a member of the board who shall be a member of the Master Plumbers' Association.

Sec. 2. The president of each association shall be by virtue of his office an alternate member of the board.

Sec. 3 The members of the board, shall serve one year, or until their successors shall qualify. At the first election of board members one from each association shall be elected to serve one year and six months.

Sec. 4. The members of the board, the secretary excepted, shall be paid $3 for actual service at each meeting.

Sec. 5. The secretary of the board shall be paid a stated salary, as may be hereafter agreed upon by both associations.

Sec. 6. The board shall charge a nominal fee for examinations and for indenture and efficiency papers, the proceeds to be used in defraying the expenses of the board.

Sec. 7. The expenses of the board not otherwise provided for shall be borne by both associations.

ARTICLE II.

POWER OF THE BOARD.

Section 1. All apprentices shall be indentured through and be under the protection of the board, who shall see that all its rules are obeyed and that the apprentice once accepted has the opportunity to finish, at which time, if he passes the examination decided on by the board, he shall receive a certificate of efficiency from the board. If he fails at the first examination he shall be given the opportunity to appear again for examination at the future sittings of the board, providing three months have elapsed since his last examination.

Sec. 2. An agreement shall be entered into between the board and apprentices defining the responsibilities of both parties. The board's obligation shall not be of a financial nature.

ARTICLE III.

DUTIES OF THE EMPLOYER.

Section 1. Any employer obtaining or indenturing an apprentice through the board shall give a written guarantee to the board to furnish said apprentice with employment, together with every opportunity to learn the trade thoroughly under the board rules as long as he is able to keep the proportionate number of journeymen.

Sec. 2. Any employer who may consider his apprentice as unworthy or incompetent may have him brought before the board, who shall examine into the merits of the charges. Such disposition of the case as they may determine shall be final.

Sec. 3. The placing of apprentices with journeymen shall be at the discretion of the employer.

ARTICLE IV.

NUMBER OF APPRENTICES.

Section 1. This board shall estimate the number of apprentices as to journeymen in the proportion of one to three, and one for the majority of each succeeding three, with the exception that each shop may have one apprentice. When the number of apprentices in a shop shall be out of proportion to the above rule, the board, at its discretion, shall authorize the transfer of said apprentices to shops where the proportionate number of apprentices does not equal that provided for.

Sec. 2. Junior plumbers who may not be at work at the time of the formation of this board, upon being indentured shall be distributed equally among such shops as may desire them, provided such shops shall not receive them in such numbers as to make the number of apprentices exceed the number of journeymen.

Sec. 3. Master plumbers may have their own sons indentured, irrespective of the proportionate number of apprentices, and such son while in his father's employ shall not be considered one of the proportionate number of apprentices agreed upon.

ARTICLE V

APPLICATIONS.

Section 1. Any boy desiring to be indentured as an apprentice shall through his legal guardian make known such fact to the secretary of the board, who shall keep record of such application.

Sec. 2. Any master plumber desiring an apprentice shall make known such fact to the secretary of the board, who shall send to him the first applicant on the list for trial.

Sec. 3. Sons of master and journeymen plumbers shall have preference over all other applicants.

ARTICLE VI.

APPRENTICESHIP TERMS.

Section 1. The terms of apprenticeship shall be five years.

Sec. 2. The first three months shall be on probation, and if at the end of that time the probationer is accepted, the employer shall have him brought before the board and have him duly indentured; provided, however, that his conduct has been satisfactory to his employer and he cannot retain his services the full time of his probation the balance of the time shall be at the disposal and discretion of the board.

Sec. 3. The first three years shall be served as a helper; the last six months of this time may be at practical work if the employer so desires.

Sec. 4. The next two years shall be practical work, at the discretion of the employer.

ARTICLE VII.

EMERGENCY TERM.

Section 1. In determining the status of apprentices and junior plumbers who may be working at the trade at the date of the formation of the board, they shall certify to the board the name of the employer and the number of years they have been employed. The board shall then indenture them according to the number of years they have given proof of having served; provided that all so-called junior plumbers who may be working at such date, and who may be receiving as a weekly wage a sum less than that they would be entitled to under the board's rules of service, shall be placed in that term of apprenticeship the wage of which is next below the rate they are receiving, and the board shall determine when such year of apprenticeship will cease.

Sec. 2. All so-called junior plumbers who may not be at work at the date of the formation of this board shall be placed in the same grade and under the same conditions as if they were at work and were receiving for such work the weekly wages that they last received continuously for a period of three months.

ARTICLE IX.

EMERGENCY WAGES.

Section 1. All so called junior plumbers who may be working at the trade at the date of the formation of this board, and who may be receiving a weekly wage at variance with the board schedule, shall continue to receive such wage until such time as they would be entitled to an increase under the rules of service of the board.

ARTICLE X.

STRIKES.

Section 1. In case of strikes or lockouts, boys indentured by this board who previous to its formation had not served as junior plumbers shall be under the direction of the employers, subject to article VI.

ARTICLE XI.

SHOP RULE.

Section 1. No journeyman shall work in a shop where the apprentices are not indentured by this board.

Sec. 2. No master plumber shall keep in his employ any apprentice unless indentured by this board.

ARTICLE XII.

AMENDMENTS.

Section 1. The board shall from time to time suggest such amendments to the code as they may deem advisable, and such amendments shall become part of the code when ratified by both associations.

MUTUAL AGREEMENT.

This code shall go into effect on the date of the ratification by both associations of the details to be drawn up in conformity with it.

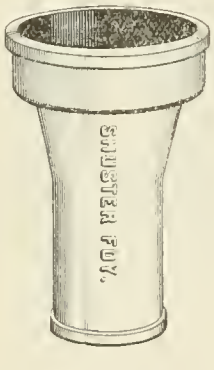
Respectfully submitted,

JAMES H. ROCHE, C. J. HERBERT, JOS J. BREEN, ALEX J MURRAY,	Master Plumbers' Committee.
EDWIN S. MARSH, JOSEPH ALLCOCK, JOHN J. DWYER, JOHN J. MEANY, C. DESORMEAUX,	Journeymen Plumbers' Committee.

Criticisms regarding the above code are invited by the committees, and can be sent to the office of the secretary, Alex. W. Murray, 197 Madison street, Chicago.

Increaser for Terra Cotta Pipe Connection.

The illustration herewith is of a fitting for connecting terra cotta pipe with iron pipe, lately introduced by the Shuster Foundry of Franklin and Willow streets, Philadelphia, and South



Increaser for Terra Cotta Pipe Connection.

Pittsburg, Tenn. It has been designed to meet the objections of many plumbers to the fittings at present in use for this purpose, and which, it is complained, are mostly of insufficient length outside of the taper to allow of proper calking, or have the reducing principle contained in a shoulder, naturally presenting an opportunity for lodgment of sewage matter. It will be noticed that there is in this fitting ample length outside the taper to allow of easy and perfect calking of the joint, and that the shape of the bell presents no opportunity for the lodgment of matter likely to cause an obstruction. The fitting is made for 4-inch, 5-inch and 6-inch iron pipe connection, and the bell is sufficiently large to take terra cotta pipe of the same inside diameter.

Inspector Ford's Address.

On invitation, William A. Ford, the new plumbing inspector of Cambridge, Mass., made an address before the Master Plumbers' Association, explaining that by the law of 1893 it was mandatory for towns of 5000 inhabitants to provide for the licensing of plumbers and the regulation of their work. In discussing the ordinance which the city promptly passed, he remarked that in general its provisions are understood.

The details of the ordinance may in a general way be said to demand a drainage system constructed of cast iron pipes of standard weight, joined together in the usual way, carried through the roof, with the necessary trap at the sewer end, and the whole put together in a manner to be impervious and tight. The introduction of the "fresh air vent" is left optional, as recent observations lead many to believe that under low barometric conditions this vent is dangerous. The evidence is rather obscure, certainly not sufficient to warrant its total exclusion. We leave it an open question.

We demand all fixtures to be separately trapped, with this exception: "One bowl and one washtub or one set of trays and one sink may be served by one trap, provided the distance between them is not greater than 2 feet." I am not prepared to indorse even this exception, still there is no strong objection, and the exactness of the limitations surrounding its use will prevent any abuse. All traps, wherever and however located, without exception as to form or design, must be protected from atmospheric influences by such vent pipes of the material, and constructed in a manner prescribed in this ordinance. This rule is without exception and absolute. I am aware that under certain circumstances ex ception to this rule is advocated. As plumbers we are all aware that under some conditions in location and design of traps, the liability of syphonage will range from the highly probable to the reasonably improbable.

I am sure that no man who values his opinion, certainly no man who is publicly responsible for it, would willingly decide that any particular trap, placed in any particular location, would or would not be liable to be affected by syponage. All work not in the strictest sense a mere repair of a leak must in every case come under the operation of the ordinance. An application will be required, a permit issued and an inspection will follow. This is very important, that power to do work aside from the terms of the ordinance must be very limited. To give to designing men any latitude under the specious guise of "repairing leaks" would lead to extensive violations of the ordinance, equally as damaging to the purposes of the department which I represent and to your interests as honest plumbers.

After going over the plan perfected for the issuing of permits and other details of the department, he made the following remarks in closing:

And now, gentlemen plumbers, we ask your co-operation. That there are minor hardships is undeniable, but probably not more so than in other rules of law. These laws are created to meet general conditions and cannot be bent to meet individual cases. We are willing to meet criticism. Do not make it a "carping" one. This law is for your protection as well as in the interest of the public health. It establishes a uniform standard of work. You are enabled to know the conditions under which you all must do business. It relieves you from the importunities of the penurious. It protects the honorable business man from the empiric. It protects the skilled journeyman from the "half backed" helper; and last, but not least, those that are too willing to prostitute the considerations of health and safety to their instincts of pecuniary gain may be protected against themselves.

TRAPS AND VENTS.

M. C. COSTELLO AND GRANT E. SMITH have formed a partnership in the plumbing business and rented the store 213 West Water street, Elmira, N. Y.

AT A RECENT MEETING of the Council of Jersey City, N. J., plumbers' licenses were granted to John J. Duff, Valentine Ringle, Richard Heatherton, Charles A. Ormsby, P. H. May, to make connections with the water mains of Jersey City, and also to do general plumbing work, when they file the required bonds in the office of the Permit Clerk.

WM. MCKEY will erect at Forty-first street and Grand boulevard, Chicago, Ill., a four story and basement apartment house, at a cost of $25,000, which will be heated by steam.

SEVERAL PLUMBERS were recently fined in the Recorder's Court at Savannah, Ga., for working without a license.

THE ANDREW J. ROGERS COMPANY, Paterson, N. J., have filed a certificate of incorporation with the County Clerk. They will carry on the plumbing and tinning business.

WILLIAM H. KAVANAUGH & CO., Buffalo, N. Y., general plumbers, have certified to the County Clerk the dissolution of the firm's partnership.

FREDERICK HELLER, a New Jersey plumber living at Caldwell, has increased the speed that he was able to attain on his bicycle by adapting the twin screw propeller and attaching it to the frame. Power is transmitted from drums on the axle through belts, and, though not a fast rider, by its aid he has been able to pass his old competitors. A patent on the appliance has been applied for.

The Metal Worker has received from Secretary Wm. G. Wacker of the Master Plumbers' Association of Toledo, Ohio, the following invitation, which will also be received by the plumbers of Ohio: "You are cordially invited to attend the annual convention of the Ohio State Association of Master Plumbers, to be held in this city February 13 and 14, 1894. Headquarters at Boody House; convention at Memorial Hall."

THE FIRM OF HITCHCOCK & BLANCHARD, Palmer, Mass., who made a business of plumbing and heating work, have been dissolved by the expiration of the contract between the two members, and Mr. Hitchcock will continue the business at the old stand on Central street.

A DISPATCH from Lynn, Mass., reports that a fire which broke out in the Osborne Block, Market Square, in that city, on January 29, damaged Wiley's plumbing store to the extent of $1000.

NOTICE OF THE DISSOLUTION of the limited partnership of William H. Kavanagh & Co, Buffalo, N. Y., plumbers and gas fitters, was filed in the County Clerk's office recently. The firm was composed of W. H. Kavanagh and George Parks.

PRESIDENT DANIEL G. FINNERTY of the National Association of Master Plumbers and State vice-president of Maine John B. Smith of Lewiston held a meeting at Bangor on January 22, at Augusta on the 23d, at Lewiston on the 24th, and at Portland on the 25th, and were successful in organizing

temporary associations of master plumbers. At each city representatives from adjacent cities were present and a strong State association is expected to be the outcome, as 50 representatives were present at the different points, and were impressed with the benefits that arise from a closer acquaintance and co-operation.

THE FIRM OF ROBINSON & LANGDON, plumbers, on Pearl street, Hartford, Conn., has been dissolved The business will be conducted by Thomas H. Langdon.

THE FIRM OF MERRICK & DONALDSON, plumbers, of New Brighton, Pa., have dissolved partnership by the purchase by Mr. Merrick of Mr. Donaldson's interest. Mr. Donaldson, so it is reported, will open another shop.

THE MASTER PLUMBERS' ASSOCIATION of Grand Rapids, Mich., has elected the following officers for the ensuing year: President, W. T. McGurrin; vice president, A. M. McPhail; secretary, W. C. Weatherly; treasurer, Fred Shriver, Sr.; sergeant at arms, Benj. Powers.

J. F. THOMPSON, J. A. Waugh and Wm. Meinhardt of Duluth, Minn., have filed articles of incorporation for the formation of the Thompson-Waugh Company, with a capital of $10,000, for the transaction of a plumbing, heating and gas fitting business.

WM MORAN, 24 Diamond street, Titusville, Pa., is a plumber who appreciates the value of an up to date showroom displaying modern plumbing and gas fixtures. He is agent for the Joy boilers and radiators, and makes a specialty of heating and ventilation.

WE HAVE TO RECORD the death, on the 12th inst., of Thos. Casey, the secretary and treasurer of the McCambridge Company, Limited, of Philadelphia, manufacturers of plumbers' supplies. Mr. Casey had been identified with the business of the house for upward of 25 years, and at the time of his death was senior member of the company. He was well known to the trade in Philadelphia and held in great esteem by his associates in business and all with whom he came in contact in a business way. Many plumbers in the city of Philadelphia have lost in him a friend who was always ready to lend his assistance in a time of need, and many instances are recorded of his open handed generosity and good heartedness. Mr. Casey was 66 years old. The cause of his death was apoplexy.

J. F. CRINKLAW having purchased the interest of Mr. Burgess in the establishment of Berg & Burgess, under 19 West Main street, Marshalltown, Iowa, the new firm of Berg & Crinklaw will hereafter continue the business at the old stand.

SUPERINTENDENT BELKNAP of the Board of Health of Rochester, N. Y, announces that he is now ready to register plumbers and issue certificates to them. This is in accordance with the provisions of a State law. The plumbers must also secure licenses from the Executive Board.

NOTICE IS ISSUED from St. Paul, Minn., under date of January 26, that the partnership of Michel, McDonough & Bowers has been dissolved by mutual consent, Joseph Michel retiring from the business. James T. McDonough and William L. Bowers will continue the business under the firm name of McDonough & Bowers.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

MANDEL BROS. will erect a four-story apartment house 60 x 66 feet, costing $35,000, and heated with steam, at Thirty-seventh street and Rhodes avenue, Chicago, Ill.

HENRY V. PIERPONT has the contract to erect for Henry Ives Cobb, a four-story apartment house at the corner of Evanston and Barry avenues, Chicago, Ill. It will cost $78,000 and will be heated by steam.

J. C. GRIFFIN, Chicago, will erect a four-story apartment house at Forty-eighth street and Indiana avenue, costing $40,000, to be heated with steam.

C. B. MCLACHLIN will build a three-story apartment house, 40 x 85 feet, at a cost of $25,000, to be heated by steam, at Sixty-fifth and Wright streets, Chicago, Ill.

THE CONTRACT for finishing the interior of the Government Building, at Lewiston, Maine, and for the plumbing has been awarded to M. C. Foster & Co. of Waterville. Their bid was $18,-990.

THE JOHNSON ELECTRIC SERVICE COMPANY, Milwaukee, Wis., have been awarded the contract for installing the Johnson heat regulating apparatus in the new almshouse building at Wauwatosa. Their bid was $3987.

BIDS WILL BE RECEIVED by the Board of Education of Brooklyn, N. Y., up to February 6, for the plumbing and gas fitting for the boys' High School, corner Marcy and Putnam avenues.

THE STEAM FITTING for Company F Armory and the new hospital addition, now nearing completion, at Santa Monica, Cal., is the work of the subcontractors, Stevens & Stewart, who planned and executed the entire steam system of the Bradbury Block, Los Angeles, which is considered a fine piece of work.

THE BARRON STEAM HEATING COMPANY, 43 Dey street, New York, are using Bronson's steam boilers and Kensington radiators in two apartment houses at Eighty fourth street and Ninth avenue, New York.

GEORGE GATES, Nyack, N. Y., recently installed a No. 224 seven-section Richmond steam heater in the residence of Mrs. Wilcox.

AMONG THE CONTRACTS lately taken by the J. L. Mott Iron Works, 311 and 313 Wabash avenue, Chicago, can be mentioned the following: Combination warm air and hot water heater in residence of Alex. Chytrans, Arlington place; Mott's Comet warm air furnace in residence of Martin Anderson, Maplewood avenue, between Potomac and Hirsch streets; Mott's Star warm air furnace in residence of C. W. Mills, Bowen and Langley avenues.

THE ILLINOIS HEATING COMPANY, 88 Lake street, Chicago, have taken contracts for hot water heating in the following buildings: Residences of Henry Neurmberger and Fred. E. Cure, Indiana avenue, near Fifty-ninth street; residence of C. Ohm, 506 Belden avenue; apartment building of Paul Jaeshke, 72 Center street; residence of Wm. Hoyt, Englewood, and residence of E. C. Bates, 562 Boulevard place.

E. BAGGOT, 169 and 171 Adams street, Chicago, is to supply the plumbing and gas fitting in the residence of Alex. Ross, 1849 Barry avenue; the 19 flat buildings of Frank J. Urston, 3554 Cottage Grove avenue, and the St. Nicholas Hotel, St. Louis.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until February 20 for the plumbing and sewer connection at the United States Post Office, &c., building at Vicksburg, Miss. Drawings and specifications may be had from the Supervising Architect, Washington, or from the office of the custodian at Vicksburg.

THE WALCOTT-HURLBUT COMPANY, 175 and 177 Lake street, Chicago, are to furnish for the Newberry apartment building, corner State and Oak streets, 40 Princess enameled baths, 40 Mælstrom syphon jet closets, 40 lavatories with Puritan enameled basins and 40 Economy laundry tubs. The plumbing work is to be done by the Wells & Newton Company, 1108-1109 Monadnock Block.

THE L. H. PRENTICE COMPANY, 203 and 205 Van Buren street, Chicago, are to furnish the steam heating plant in the residence of Byron L. Smith, Lake Forest, Ill.

BUROIN BROS., Springfield, Mass., will use the Fuller & Warren Company's hot water apparatus to heat an apartment house being erected in that city.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until March 7 for the low pressure return circulation steam heating and ventilating apparatus for the United States Post Office building at San José, Cal. Drawings and specifications may be obtained from the Supervising Architect, Washington, or from the office of the superintendent at San José.

THE AUTHORITIES of Glenn County, Cal., have let a contract for building a court house at Willows to cost $76,-497. In addition to that sum $5600 will be paid for a hot air heating and ventilating system.

A. B. WILKINSON, West Haven, Conn., has been awarded the contract for plumbing and heating the new Samoset Club house.

SEALED PROPOSALS will be received at the office of the Supervising Architect, at Washington, D. C., until February 21 for the plumbing and gas piping for the United States Post Office building, Lowell, Mass. Drawings and specifications may be obtained from the Supervising Architect, Washington, or at the office of the superintendent at Lowell, Mass.

THE AUBURN STEAM BOILERS made by F. W. Wright, 6 Bridge street, New York, were recently used by Geo. H. Murphy, Bound Brook, N. J., in heating the residences of Wm. Koetchlein and architect and builder Geo. Stryker, where he also erected the plumbing system. He used a special system of return mains in the heating plants.

W. FRANK B. FISHER, Springfield, Ohio, sends us an advertising postal card that ought to bring him no little trade. It begins by addressing an imaginary customer, asking him if he is going to build or have any repairs done, &c. Then Mr. Fisher proceeds to tell about five grades of work which he does. If it is necessary to do a cheap job he will do it, but it will not give general satisfaction. Then he does a good, a guaranteed, a reliable and extra quality work, the grades in each case being described. Mr. Fisher's specialty is spouting, roofing, valleys, repairing, &c.

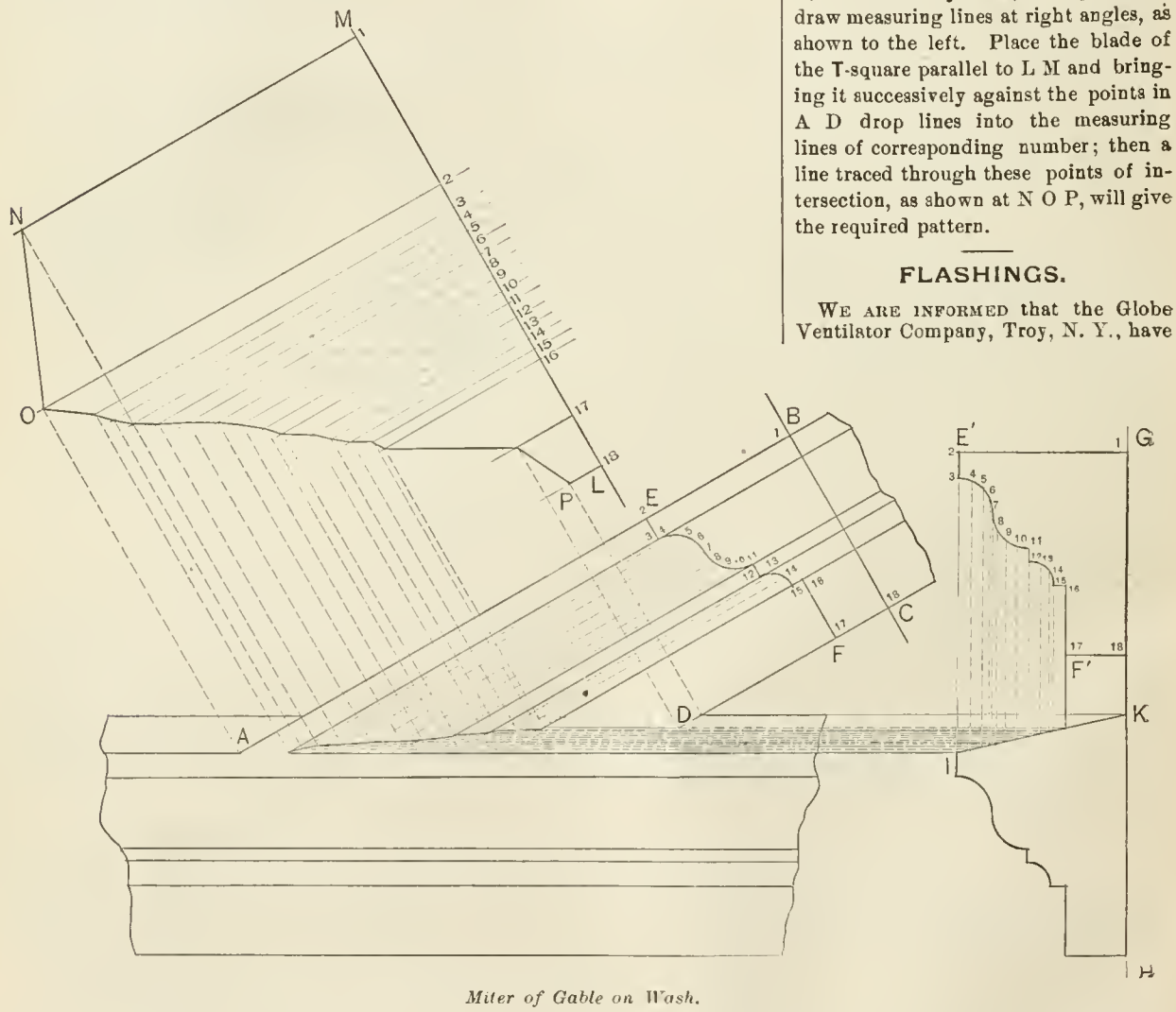
ROOFING AND CORNICE.

Miter of Gable on Wash.

From J. F., *Savannah, Ga.*—Please explain to me through *The Metal Worker* how to obtain the pattern for a gable mitering on a wash, as indicated in the inclosed sketch. I have looked for the problem in books on sheet metal work, but have not found it.

Answer.—In the original compilation of *The Metal Worker* pattern book this particular problem was not included, although its principles are involved in the solution of those problems relating to the mitering of hip moldings of a mansard roof down upon a wash at its base. Our correspondent's sketch has not been reproduced exactly, but its essential feature is embodied in the illustration, which treats the problem in its simplest form.

Let A B C D be the front elevation of the foot of a gable molding mitering down upon an inclined wash forming the top of a level cornice below said gable—a feature of design of quite frequent occurrence. E F shows the profile and its projection from the wall B C. It will first be necessary to construct a sectional view, as shown at the right of the elevation, in which G H represents the face of the wall and K I H the profile of the level cornice of which I K is the wash upon which the gable mold is required to miter. Place a duplicate of the profile of the gable molding E F at any convenient distance above the section, as shown by E' F', keeping the projection E' G equal to E B. Before the miter pattern can be developed it will be necessary to obtain a correct view of the miter in elevation, as shown from A to D. To accomplish this divide both profiles of the gable mold into the same number of spaces as shown by the small figures 1 to 18 in each. From the points in the profile E F carry lines parallel with the pitch of the gable indefinitely toward the foot of the molding. From the points in the profile E' F' drop lines vertically, intersecting the wash I K, as shown. From the points of intersection in I K carry lines horizontally to the left, intersecting them with the lines of corresponding number drawn from E F. A line traced through the points of intersection will complete the elevation, but is not in itself really necessary, as the miter pattern is developed by lines projected from these points of intersection. Upon any line drawn at right angles to A B lay off a stretchout of the profile B E F C, as shown by L M, through which draw measuring lines at right angles, as shown to the left. Place the blade of the T-square parallel to L M and bringing it successively against the points in A D drop lines into the measuring lines of corresponding number; then a line traced through these points of intersection, as shown at N O P, will give the required pattern.



Miter of Gable on Wash.

FLASHINGS.

We are informed that the Globe Ventilator Company, Troy, N. Y., have furnished two of their 60 inch Globe ventilators for the new opera house at Oswego, N. Y.

L. D. Berger, 224 Arch street, Philadelphia, Pa., is sending out to the trade a calendar for the current year. The upper part of the poster calendar contains a business announcement of Mr. Berger, who is a manufacturer of tinners' and roofers' supplies, besides being a dealer in tin plate, registers, &c. At one side of the announcement is an engraving of Mr. Berger's place of business on Arch street. An unusual feature of the cal-

endar is that the days of the month appear in white upon a black background. They are in this way made very clear and conspicuous.

GEO. C. KEENE & Co., Cincinnati, Ohio, report the shipment of an entire carload of iron roofing machinery to the Cambridge Roofing Company, Cambridge, Ohio, last week; an 8-foot flanging machine to the Michigan Stove Company, Detroit, Mich., and numerous other machines to Chicago and other points.

THE COPPER WORK AND CORNICES on the St. Luke's M. E Church at Long Branch, N. J., were recently completed by J. F. Stephenson of Lakewood.

A LARGE ADVERTISING SHEET is issued by Berger Brothers, 237 Arch street, Philadelphia, Pa., addressed to architects and builders, and also to wholesale dealers. The sheet shows two views of the handsome residence, Fairview, of W. H. Berger, at Wyncote, Pa., which is equipped with Berger's hangers. There are several other illustrations on the sheet showing the new and old fashioned gutters, and a number of illustrations are presented of Berger's pipe fasteners.

THE TWELFTH ANNUAL MEETING of the stockholders of the Cambridge Roofing Company, Cambridge, Ohio, was held January 6, attendance being full. Considering the extraordinary conditions of the past year a satisfactory report was presented. The old Board of Directors was re-elected, with A. W. Nicholson as president and S. W. Nicholson as secretary and treasurer. W. C. Cowgill will continue to represent this company on the road. The Chattanooga branch manufactory of this company is now owned and operated by the Chattanooga Steel Roofing Company, Chattanooga, Tenn., under the general management of J. E. Annis, formerly of Cambridge, Ohio.

JAMES BUCKLEY and J. L PERKINS have formed a copartnership under the name of Buckley, Perkins & Co., and have secured a commodious salesroom at 243 Lake street, Chicago. The firm will carry a full line of tin plate, galvanized sheet iron, steel roofing, corrugated iron, conductor pipe, eave trough, roofers', tinners' and cornice makers' supplies. Mr. Buckley has been with the "C. H. B." Sheet Milling Company for the past seven years, and is well known to the trade. Mr. Perkins has been connected with the sheet mill trade for the past 12 years, and for two years was manager of the Illinois Roofing & Supply Company.

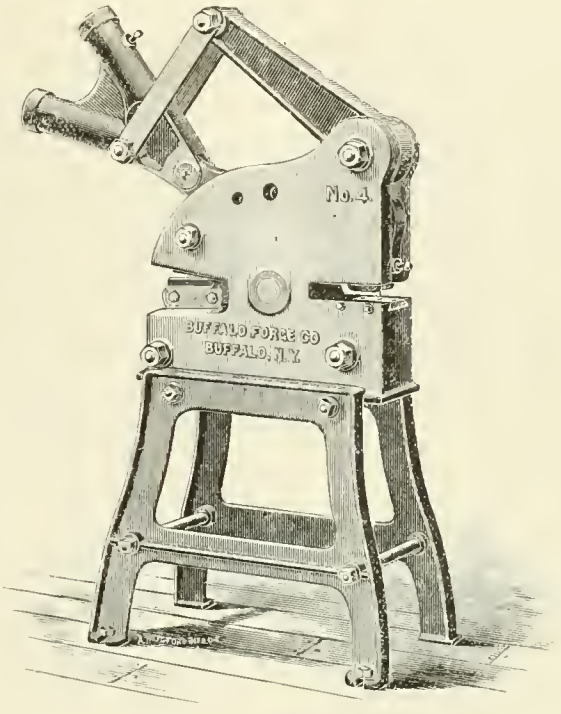
AMONG NEW CONCERNS recently incorporated at Albany, N. Y., is the Paradigm Construction Company of New York, to manufacture skylights, glass and metal roofs, &c., with a capital of $10,000. The directors are Arthur E. Rendle, Seymour P. Thomas and David W. Sisson, New York City.

THE WHEELING CORRUGATING COMPANY of Wheeling, W. Va., have opened a warehouse at 472 Laflin street, Chicago, where they will carry a complete stock of corrugated iron, steel roofing, steel siding and steel ceiling, galvanized steel eave trough and conductor, black and galvanized sheet iron and steel. The location of this warehouse is excellent and will insure quick deliveries.

A PRESS DISPATCH from St. Louis, Mo., states that owing to a reduction in wages about 200 employees of the St. Louis Roofing Company went on strike February 1.

The Buffalo Punch, Shear and Bar Cutter.

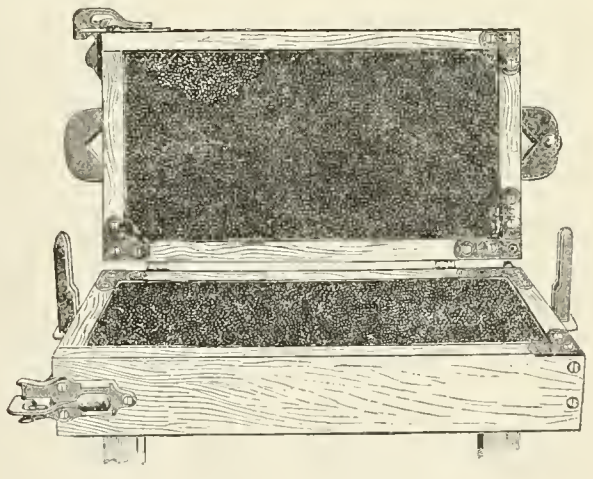
The construction of this machine is such that the operator can use it without a helper on the heaviest work. No adjusting is required in changing the work, the machine being always ready for performing any of its three functions of punching, shearing or bar cutting. The mechanism consists, as will be seen, in a combination of levers, so arranged that the cutting is done up from the bottom. The machine is built in four sizes by the Buffalo Forge Company of Buffalo, N. Y. Capacity No. 1 will shear ½-inch strap iron 1½ inches wide, will punch ½ inch in ⅝ inch iron and cut off ⅝ inch. Capacity No. 2 will shear ⅝-inch strap iron 2 inches wide, will punch ¾ inch in ¾-inch iron and cut off ¾ inch. Capacity No. 3 will shear ¾ inch strap iron 3 inches wide, will punch ⅞ inch in ⅞-inch iron and cut off 1 inch. Capacity No. 4 will shear ⅞-inch strap iron 3 inches wide, will punch 1 inch in 1-inch iron and cut off 1¼ inches.



THE BUFFALO PUNCH, SHEAR AND BAR CUTTER.

The Diamond Snap Flask.

The Diamond Clamp & Flask Works of Richmond, Ind., manufacture a flask which is put together by templets so that the parts are interchangeable. The flask is operated in the same way as other snap flasks with these exceptions: Instead of unlatching one part at a time, in the ordinary way, both parts are unlatched at one operation. Closing the two parts latches them ready for another mold. The construction of the flask is clearly shown in the engraving.



THE DIAMOND SNAP FLASK.

It has been decided by the committee appointed to settle the site of the French Exposition of 1900 that the great fair shall be held in Paris itself. It is to occupy the Champs de Mars, the Trocadero, the Esplanade des Invalides, the Quai D'Orsay, the Palace of Industry and the surrounding ground. A special bridge is to be constructed for the occasion over the Seine, the main entrance to the exhibition being on the Place de la Concorde.

STEAM AND HOT WATER.

The Velocity of Circulation in a Water Warming System.

BY KNIGHT.

The dominant principles and general detail connected with a hot water circulation are, without doubt, fully recognized and understood by the trade at large. There would seem to be, however, some few of the minor questions with regard to the circulation upon which general opinion differs widely. It would be hard to decide just when and why such differences occur or why the differences should be so exaggerated. There is one question in particular which seems to be shrouded in considerable mystery and concerning which there appears to be little or no exact information. This question is in relation to the velocity with which the water in a warming apparatus circulates in the pipes and radiators. The writer has in mind at this writing a case which was brought up in a court in Massachusetts where the decision turned on what was to be considered a proper circulation in the pipes and radiators of a warming apparatus. To settle the question, the services of two engineers were secured who discussed at considerable length this matter of the velocity of flow, but were unable to give information in this regard sufficiently definite to be accepted by the court.

Varying Velocities.

The popular idea with regard to the velocity is in favor of a velocity which is so slow as to be almost imperceptible. While opinions on this subject vary from the idea of an imperceptible current to a velocity approaching that to be observed in the water flowing from the nozzle of an ordinary hose pipe under a head of 50 or 60 pounds, the matter of determining the exact velocity under any given conditions, as a matter of fact, does not present any extreme difficulty. The truth of the matter is that the velocity of the circulation in the water in any apparatus varies at different times, and also varies in the different mains and branches of the system. The reasons for this are clearly apparent, when it is borne in mind that the circulation is dependent upon the cooling which the water undergoes in the return pipes and radiators.

Now, if any one part or branch of a system is at any given time doing more work, or in other words, undergoing a greater cooling effect than another part of the same system, it will be necessary that there be supplied to the part doing the most work the greatest amount of water. The velocities in a system may not, necessarily, differ to any great extent at any given time, but still a careful consideration of the conditions which govern the flow would show that it would be seldom that such velocities in the different parts of the apparatus would be identical. As the circulation, however, is dependent upon the cooling effect, the velocity with which the current flows to and from the radiating surface is a feature which, to a certain extent, increases and diminishes according as the work to be done increases or diminishes. If a radiator is doing an amount of work which requires that there be flowed to it a certain number of pounds of water per hour, the velocity with which the water flows in the supply mains is governed to a large extent by the size of the pipe connection. That is to say, a radiator requires a certain amount of water. If the connections to a radiator are small, that amount of water must be passed through at a greater velocity than would have to be maintained in supplying the same amount through a pipe of large internal area. As the cooling effect sustained by the radiating surface, or in other words, the work to be done, is the determining factor in the amount of water to be supplied, it would follow that we may disregard the size of the supply pipes within certain limits, always remembering that the larger pipe is preferable in a choice of two sizes, inasmuch as it permits a lower velocity and a consequent lessening of the friction.

A Practical Example.

To obtain a proper consideration of this question let us assume for the moment that we have in a room a radiator of 80 square feet of radiating surface. For one hour this radiator maintains a temperature of 72° F. in the room. We will assume, for the purpose of illustration, that the radiator holds 125 pounds of water, and is supplied by a 1½-inch pipe, with a corresponding size for the return. The water, we find by applying thermometers to the supply and return pipes, is 195° F. when it enters the radiator and is 180° F. in the return pipes. The point we wish to arrive at is: How many times that radiator, under the given conditions, will empty itself in an hour, and knowing that and the size of the supply pipe, we can readily determine with what velocity the water must have flowed to meet these demands.

Our assumption at starting was that this radiator was to maintain a temperature of 72° F. in the room for one hour. By maintaining the temperature in the room at 72° we must necessarily have brought into the room through the radiator as many units of heat as have been lost to the room through the walls, windows and other exposures In any case, the gains fully equaled the losses, otherwise the temperature would not have been maintained. Now, it has been proved by experiment that there will be given out from 1 foot of radiating surface about 2 units of heat per hour per degree difference in temperature between the radiating and receiving surfaces or bodies. In the present instance if the supply water is 195° and the return water 180° the mean temperature of the radiating surface would be 187½° F., which would give us a difference of 115½° between the radiating surface and the air in the room, which, by our original assumption, was to be maintained at 72°. Now, if each of the 80 square feet of radiating surface gives off 2 heat units per hour for each of the 115½° of difference between the surfaces and the air we shall have given out to the room a total 18,480 units of heat.

A unit of heat is the amount of heat which is required to raise the temperature of 1 pound of water 1°, consequently it is the amount of heat which is given back by cooling 1 pound of water 1°. To warm the room in question we have used 18,480 units of heat. We therefore have done the work equivalent to the cooling of 18 480 pounds of water 1°. By our original assumption the water in the radiator was to be cooled 15°. Therefore, to furnish 18,480 units of heat it would require 1232 pounds of water cooled 15° to equal in effect 18,480 pounds of water cooled 1°. We can therefore assume that we have passed through the radiator, under the given conditions, 1232 pounds of water in one hour. As the radiator contained when full 125 pounds of water, we have changed the water in the radiator about 9⅞ times.

The question of the velocity of the current can now be definitely settled, as the problem assumes a very simple form The question now is, with what velocity must the water flow through a 1½-inch pipe to supply 1232 pounds per hour. One linear foot of a 1½ inch pipe contains 0.76 pound of water. Dividing 1232 by 0.76 shows us that the velocity of the water in the pipe to deliver 1232 pounds per hour must have been 1621 feet per hour, or a velocity of 27 feet per minute.

An Average Speed.

This velocity of 27 feet is not an extreme velocity to be met with in a water circulation. It is, perhaps, an average velocity. It will be seen at once how much this velocity may be influenced by existing conditions and how frequently and constantly these conditions are changing in actual practice. The above problem, however, will show a method by which the velocity of circulation under any given conditions can be approximated. We assumed in one place that there were 2 units of heat given out for every foot of radiating surface for every degree difference between the surfaces and the surrounding air. In solving problems in actual practice it would be better to base the calculations on a loss of about 1 75 units of heat per square foot of surface, as that would be found nearer the average, owing to constructional features of the radiator and adverse conditions under which the heat is given off from the ordinary radiating surface, as seen in the average warming apparatus.

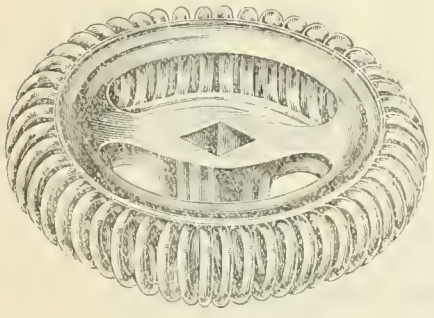
Velocities of the water in the circulation may frequently be found as high as 60 or even 80 feet per minute, and under the proper conditions much greater velocities could doubtless be attained. A further consideration of this question would throw light on the matter of the amount of water which a radiator will properly contain to do the most effective work, and would doubtless abundantly demonstrate, considered in a proper light, that the amount of water contained in any form of radiating surface plays but a small part in deciding

its efficiency; the whole question summed up being merely the choice as to a large body of water cooled a few degrees or a smaller body of water cooled to a greater extent. How important it may be as a practical feature to know what velocity the circulating water should have, from a constructional standpoint, would be difficult to state. At the same time such data would materially aid one in deciding differences of opinion concerning the size of mains and branches.

The velocity of the water in the mains may be computed on precisely the same basis by considering any given number of branches or radiators as a single radiating surface, noting the temperature of the supply and return water and following exactly the same direction as outlined above

Zero Steam Valve Wheel

W. F. Greene of 1931 to 1937 Sixth avenue, Troy, N. Y., has just brought out a novelty in the way of a handle for a steam valve, an illustration of which is presented herewith. The body of the wheel consists of a malleable iron casting provided with a coiled wire edge,



Zero Steam Valve Wheel.

so arranged as to render it always cool to the touch. The various parts are nickel plated and finished with a high polish. The device is strong, light and well adapted to serve the purpose for which it is intended.

HEATING NOTES.

Proposals will be received by the Mayor of Boston up to February 12 for heating and ventilating the primary school on East Third street, South Boston.

J. J. Wilson, heating engineer for the Fuller & Warren Company, Troy, N. Y., recently visited a number of heating plants installed in New England last fall in which their goods were used, and reports general satisfaction. He is about to make a similar visit among the trade in the West.

The Nason Mfg. Company, 71 Beekman street, New York, issue an entertaining little pamphlet in the interests of the Equator steam heater of their manufacture. The pamphlet, bound in black cloth covers, measures 6 x 7 inches in size, and contains 18 pages. The text of the pamphlet is in eight stanzas, telling in metrical form the story of Deacon Crabtree's unsatisfactory experience with a hot air furnace and the excellent results that followed the introduction of an Equator heater. While the verses are of a sort to please the reader, the more casual observer will be entertained by the seven accompanying illustrations of the deacon and his good wife, who at the beginning of the story are trying, ineffectually, to keep warm; then they show their interest in the purchase and setting of an Equator heater, and are finally comfortably settled in a warm parlor, at the back of which, if we read the drawing right, is a Nason radiator.

At 211 Water street, New York, W. M. Mackay, manager of the New York house of Hart & Crouse, Utica, N. Y., has hung out attractive signs calling attention to his house and the Royal line of steam, hot water, hot air and combination heaters. The first floor is fitted up as an office and sample room, where the various apparatus are displayed to good advantage, and a cordial welcome is extended to all visitors. The basement and upper floors furnish storage for several carloads of goods, so that orders can be filled promptly, which is a feature that will be appreciated. David Millar will give special attention to the hot air furnace department, and H. L. Annes will assist Manager Mackay in the steam and hot water department.

Jenkins Brothers, 71 John street, New York, are distributing to the trade their 1894 catalogue and price-list. This is an oblong pamphlet of convenient size, and contains illustrations and descriptions of the various Jenkins specialties, beginning with the Jenkins disk removing lock nut, the Jenkins key stuffing boxes, and then a number of pages are given to the Jenkins valves. A very large variety of these well-known goods are illustrated, and the various sizes and styles are described and the prices given. Later in the pamphlet other specialties are referred to, including their standard packing.

An attractive and somewhat elaborate calendar is issued by the Toronto Radiator Mfg. Company, Toronto, Canada, in the interest of their well known Safford radiators. The calendar, of the poster variety, measures 12 x 17 inches in size, the lower half of each sheet containing the card for the days of the month. The upper part is occupied by a fanciful engraving, reproduced in different colors, showing the Safford radiator for a background and surrounded by representatives of the various nations of the world, including Turks, Chinese, Dutch and Japanese, the place of honor, of course, being occupied by a typical Englishman. A sultana in the lower part of the picture is enjoying the comfortable presence of the radiator, and we presume that the significance of the allegory is that John Bull is making it warm for the Turk.

Albert A. Cryer & Co., heating engineers and contractors, have arranged an attractive showroom at 85 Centre street, New York. A handsome red carpet covers the floor. A space at the front is used for office purposes and a room in the rear for an engineering and drafting department. The attraction in the window is a No. 121 Victor steam heater, finished in red and gold. Samples are shown of a No. 15 and 18 Richmond steam heater and a No. 180 Richmond hot water heater. Next a No. 40 portable Victor heater for steam has the casing and a portion of the dome and tubing cut away so that the internal construction can be seen. Next is a No. 124 Victor hot water heater set in brick with a portion of the wall and staves removed, showing its construction. A No. 44 Victor for steam is set in brick and the interior exposed by a portion being cut away. The next is a No. 44 Victor steam without any covering, showing the bare boiler. On the opposite side of the showroom is a No. 224 Richmond Sectional hot water apparatus, such as is used for heavy duty. The next in order are Nos. 320 and 327 Richmond revertible flue sectional steam boilers. Just inside the door is a No. 44 Victor steam heater with the fire pot, dome and a portion of the tubes cut away, so that the working of the apparatus can be readily explained. A line of the Rex hot water heaters made by the Rex Heating Company, Norwich, Conn., is also displayed, with a line of laundry heaters. The show and drafting rooms are heated by a No. 150 Richmond hot water apparatus, set on the same floor and connected with Bundy Columbian radiators. The workshop and storehouses of the company are at 131 Worth street. A pocket catalogue, bound in Russia leather, gives the line of hot water apparatus handled by the house, with lists of radiator valves, cast iron fittings, pipe coverings and such other goods as are used by heating contractors. The back portion of the book is devoted to information that will be interesting to the trade and several blank pages are left for memorandums.

The Crane Company of Chicago, Ill., have taken the seven-story building, 122-130 Centre street, corner White, New York, occupying a space 84 x 97 feet in size. They are rapidly preparing to carry an extensive and complete line of fittings for steam, water and gas, in cast, malleable and wrought iron and brass goods Their wedge gate valves will be one of the leading specialties, and they will also handle a complete line of pipe cutting and threading machinery made by D. Saunders' Sons, Yonkers, N. Y. The basement will be used for a pipe cutting and threading department, where the trade will be supplied with pipe, according to specification, from 2 up to 16 inches, special machinery being provided for threading fittings of the largest size. Two 75 horse-power boilers and a 75 horse-power Harris-Corliss engine will be used for running the tools and the elevators in the building. The establishment will be under the management of G. Frank Uhler, assisted by Waldron Moore and J. M. Uhler.

The Niagara Radiator Company are building a radiator foundry with a capacity of 1,000,000 feet of radiation per year at North Tonawanda, N. Y., adjoining the blast furnace of the Niagara Iron Company. The company expect to melt iron March 1 and have put into their foundry and their machine shop the latest and most improved labor saving devices and machinery. They will make a full line of direct and indirect radiators for both steam and hot water. The officers of the Niagara Radiator Company are President, G. R. Howard; vice-president and manager, C. F. Walther, and treasurer, F. C. Perew.

T. Kieley, 11 West Thirteenth street, New York, is filling an order for 12 large size Standard steam traps to be exported from this country.

A. S. Matpett is visiting the trade in the vicinity of New York City in the interest of the steam and hot water heating apparatus of the Richmond Stove Company of Norwich, Conn., his New York headquarters being with Albert A Cryer & Co., 85 Centre street.

The J. L. Mott Iron Works, at 133d street, New York, which have been shut down for the past few months, are now reopened and running full time.

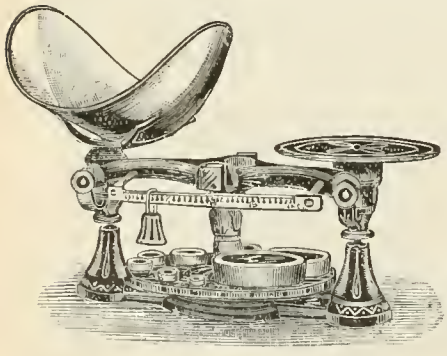
THE RETAIL STORE.

Reading Stove Dealers and Metal Workers' Association.

The third annual banquet of the Reading Stove Dealers and Metal Workers' Association of Reading, Pa., was held on the evening of Wednesday, January 24, in Rajah Temple in the city named. It is regarded by those present as among the most successful ever held by the association, its success being due in large measure to the very excellent work of the committee, consisting of Louis Dauth, William B. Yager and Harry Richards. At 8 o'clock the assembled guests partook of a very tempting dinner, after which toasts and speeches were in order. During the banquet the Amphion Quartet rendered popular selections. Milton H. Schnader presided in the absence of President H. C. Geissler. The first speaker of the evening was Charles S. Prizer, who was followed by William T. Hain, John P. Dauth, Chairman Louis Dauth, to whom much of the success of the banquet was due; W. H. Schick, William H. Bitting and Joseph Yetzer. Among those present may be mentioned the following: Milton H. Schnader, J. K. McKnight, J. S. Wise, representing the Mt. Penn Stove Works; Charles S. Prizer, president of the Reading Stove Works; Wm. T. Hain, Joseph B. Ganter, Jacob M. Prutzman, W. Bridegam, W. Thomas Crosy, Charles Markley, Arnold Dauth, Nehemiah Lewis, Walter M. Prutzman, Joseph Yetzer, Maximus N. Hornan, R. Paff, John P. Dauth, Samuel Geissler, John H. Fett, James Hafer, Adam Kolb, Charles H. Frederick, Gideon Hill, W. B. Yeager, Robert Rankin, Harry Richards, Frank Wagenhorst, U. J. Mast, Geo. Ritter, Lewis Dauth, John Luigard, Wm. H. Schick, Jacob Otto Wm. H. Bitting and William Hill.

I X L Scale.

The Southwark Scale Company, 415 South Second street, Philadelphia, Pa., are putting on the market the scale

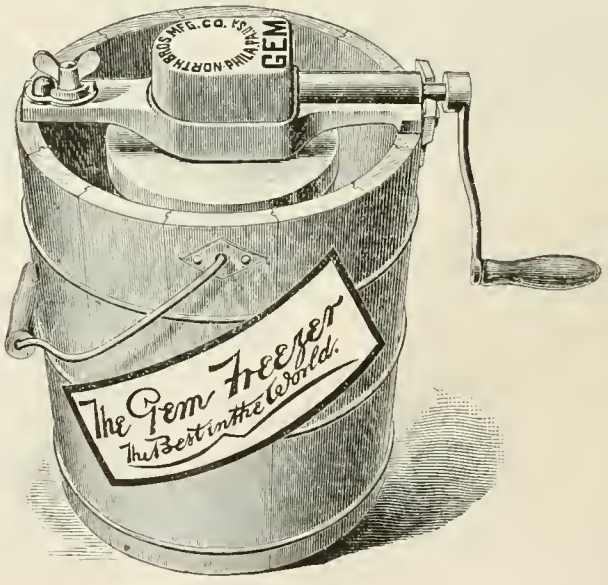


I X L Butcher Scale.

shown in the accompanying illustration. The standard is of iron and the pivots of fine tool steel. The weight holder is of iron and revolves in either direction, thus bringing the weights instantly to hand and obviating the necessity of a weight block. The beam is of brass and the pea weight of iron painted. The weights are supplied in iron or brass, as desired. The scale is handsomely painted and decorated and is made in three styles, counter and butcher scales without beams, and butcher scale with beam, as illustrated. The counter scale is supplied with any kind of scoop required. The scale is made in sizes running from 2 pounds to 16 pounds, and is designed to meet the demand for a cheap and reliable scale.

The Gem Freezer.

North Brothers Mfg. Company, Philadelphia, Pa., for whom John H. Graham & Co., 113 Chambers street, New York, are agents, are offering the Gem freezer improved, as illustrated herewith. The cap covering the gearing is now made separate, and is bolted to the cross piece instead of being cast solid. One advantage of this construction is the small cost at which the parts can be replaced if for any reason they should be broken. Another feature is

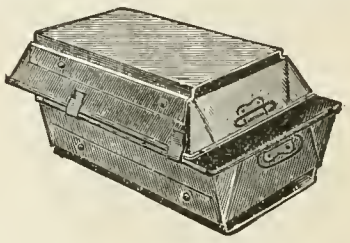


The Gem Freezer.

the arrangement of the gearing, which, it is stated, obviates all danger of its binding. All inside parts of the freezer are thoroughly coated with pure block tin, and the outside parts are galvanized. The pails are made of Virginia white cedar, upon which are used galvanized electric welded wire hoops. The hoops are embedded in grooves made in the pail, securely clamping the staves, making it impossible, the manufacturers state, for the hoops to fall off or to be forcibly removed without injury to the hoops or pail. It is claimed that expansion of the wood cannot break the wire hoops, that they will not stretch, that being round only a small portion of the surface is presented to the pail, and that the hoop conduces to a better and stronger joint than is possible by any other method. The Gem freezer is made in 1, 2, 3, 4, 6, 8, 10 and 14 quart sizes.

The Ressler Roaster and Baker.

Will & Weber, 420–422 St. Clair street, Toledo, Ohio, are putting on the market a roasting and baking pan,



The Ressler Roaster and Baker.

as shown in the cut herewith. The pan comprises two like sections, with flaring sides, held together with a novel form of hinge connection, which also allows the upper pan to be slid upon the lower pan, as shown in the cut, when it is desired to brown the article of food being cooked. There is also a double or extra bottom on each pan, which can be removed by sliding, which is designed to modify the heat of the oven in its effect upon the article within the pan, to give a uniformity of temperature during the process of baking or roasting, and to avoid all danger of burning or drying. It is pointed out that as the pans are exact duplicates the wear of the two pans is insured, as they may be reversed in position or may be used singly for other purposes; also that the detachable hinge makes it easy to secure the pans in position or to detach them.

A CIRCULAR is issued by the Pittsburgh Brass Company, Allegheny, Pa., directing attention to the Pittsburgh mammoth lamp. A general view is shown of this lamp, while smaller cuts show the spring extension and also the indicator with which the Pittsburgh

mammoth fonts are furnished. The indicator tells at a glance the quantity of oil in the font at all times.

The Improved Henry Combination Haft.

Horace E. Britton, Stoughton, Mass., is offering an improved haft with 12 tools, as shown in the accompanying

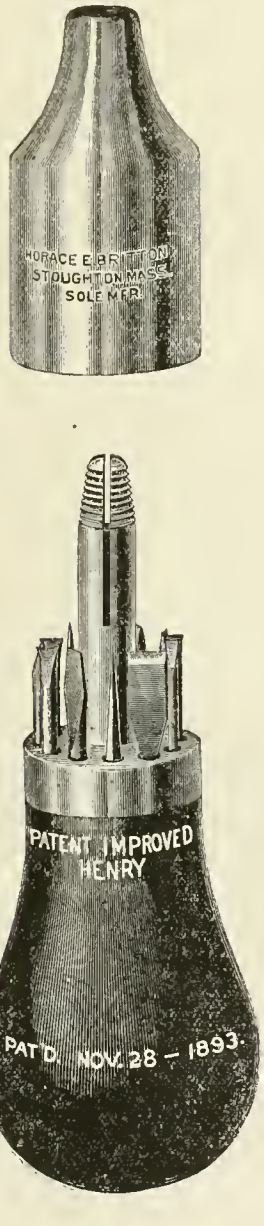


Fig. 1.—The Improved Henry Combination Haft.

cut. The improvement consists of a tempered steel pin or stud, secured between the quarters of the chuck at the bottom of the slits, and extending up between the quarters the necessary length to form a solid and sure support for the shank of the tools when in use, as shown in No. 3, Fig. 2. Fig. 2, No. 1, represents the chuck of the old style Henry combination hafts with the shoulders exposed to view, which are meant for a rest or support for the shank of the tools, and has proved to be its weak point; while No. 2 shows the old style chuck with the shoulders broken down by the shank of a tool having been driven away up between the quarters of the chuck, causing a lasting injury that renders the haft almost worthless. The new chuck, it is stated, obviates all chance of such accidents. The tools, Fig. 3, include five brad awls, one chisel, screw driver, diamond pointed awl, marking awl, countersink, tack puller and reamer. The advantages claimed for the haft are as follows: It carries the tools in the same end of the holder in which

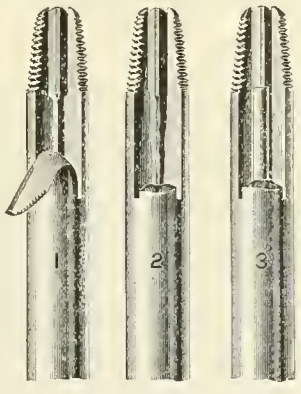


Fig. 2.—Construction of Chucks.

they are used; it necessitates no shifting of the holder end for end in changing tools; the tools do not need to be shaken out into the hand to select the one wanted; the same motion that loosens the tool in use removes the cap that covers the surplus tools; no wrench is used, and the haft can safely be used with a mallet or hammer without material injury.

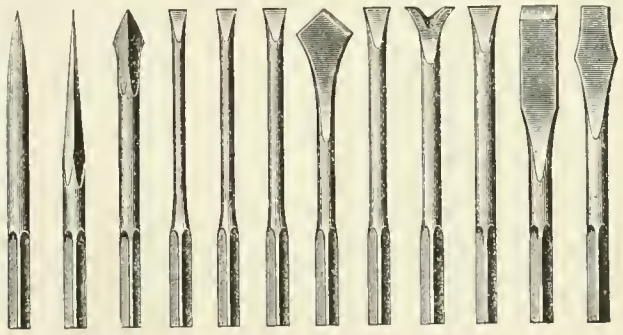
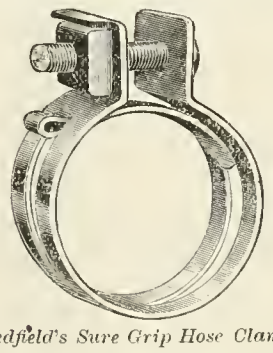


Fig. 3.—Tools Furnished with Haft.

Redfield's Sure Grip Hose Clamp.

The accompanying illustration shows a device put on the market by J R. Clancy, Syracuse, N. Y., known as Redfield's Sure Grip hose clamp. The clamp is made of wrought steel and many special advantages are claimed for it besides being low in price. A feature to which particular attention is directed is that



Redfield's Sure Grip Hose Clamp.

the construction offers a true inner circle before and after tightening. It will be seen from an inspection of the engraving how this is accomplished. The clamp at present is being made in sizes of 1 inch for two and three ply garden hose, ¾ inch for three ply, ¾ inch for four ply and 1 inch for three ply; also 1¼-inch air brake or steam hose.

MEMORANDA.

The Hurd Refrigerator Company, Duluth, Minn., issue a catalogue devoted to their refrigerators. Illustrations are given of the Hurd system of circulation as employed in their refrigerators, their patent glass trap, and of soft wood and hard wood refrigerators, sideboard refrigerators, grocers' ice chests, fish boxes, sideboard water coolers, &c. The manufacturers state that their designs for this year are new and are in keeping with the latest and best style of furniture, and that their goods are filled as follows: Next to the outer wall, and also next to the inner wall, are placed layers of odorless paper; the space between these layers of paper is filled with mineral wool, as the best non-conducting substance. Attached to the frontispage of the catalogue is the blue ribbon awarded the Hurd Refrigerator Company for their exhibit at the Columbian Fair.

The Griswold Mfg. Company, Erie, Pa., are offering the trade a novelty in tea kettles of more than usual interest. It is a new aluminum tea kettle, made of the pure metal and in a single piece. The manufacturers point out that there is no spout to melt off or seam to open and no chance for leakage. Furthermore the surface does not tarnish or corrode. It has a smooth surface like silver and it is easily kept bright, besides being stiff and firm. Aluminum is an excellent heat conductor and very well adapted for this and similar purposes. Of course the extreme lightness of the metal is another advantageous feature.

We are indebted to William T. Hain of 327 Penn street, Reading, Pa., for a four-page folder illustrating and describing the new Keystone roasting and baking pan for poultry, meats, fish, bread, cakes, &c. The circular gives directions for using the pan for its various purposes and also presents a price-list.

The Rochester Lamp Company, 42 Park place, New York City, distribute circulars illustrating the Rochester portable parlor heater of their manufacture. On the backs of the sheets a description is given of the device and its advantages are referred to.

The Little Giant Truck Company's works, at Syracuse, N.Y., have been secured by the G. L. Van Namee Mfg. Company, also of Syracuse, who will continue to manufacture the Little Giant steel trucks and other hardware specialties. The Syracuse Door Hanger Company are the general sales agents for the trucks.

The snowfalls of the past week were productive of good in affording work for a large number of the unemployed in Eastern cities and towns.

STOVE TRADE NOTES.

Cupola Management.*—II.

BY DR. EDWARD KIRK.

Sand Bottom.

When the door or doors are in place and properly supported any openings or holes that may have been burned through them are carefully covered with a thin plate of iron, and all cracks through which the bottom sand might escape when dry are closed with clay. The doors are then covered with a bed of sand several inches in thickness, which is known as the sand bottom. The sand employed for this purpose must not be of a quality that will burn away and permit the molten iron to get down to the doors or melt and form a hard mass that will not fall from the cupola when the doors are dropped, neither must it be so friable as to permit the molten iron to run through it when dry.

The clay sands when used for a bottom burn into a hard, tough mass that adheres to the lining all around the cupola, and the small cupola frequently remains in place after the door is dropped and has to be dug out with a bar before the cupola can be dumped. Parting sand, sharp and fire sands are very friable and difficult to keep in place. They do not resist the action of the molten iron well, but melt and form a slag. Mixtures of clay and sharp sand burn too hard and do not drop well. The loam sands are the only ones suitable for a sand bottom, and sand that has been burned to a limited extent makes a better bottom than new sand.

In stove and other foundries with large gangway floors the scrapings from the gangways are collected in front of the cupola, passed through a No. 2 riddle to recover the scrap iron and the sand used for the cupola bottom. This sand makes the very best kind of a bottom. It is clean and free from cinder, soft and pliable, packs close, resists the action of the molton iron and drops free. In foundries where the daily gangway cleanings are not sufficient to make the bottom, part of the old bottom is used over and the gangway cleanings are mixed with it or placed on top. In foundries where there are no regular gangways to clean every day the heavy part of the dump is thrown out and the sand bottom passed through a No. 2 riddle and used over again. When the bottom sand is used over day after day it must not be riddled out too close and a little fresh material must be added to it each day to prevent it becoming rotten from repeated burnings and containing too many small particles of cinder, which render it fusible and easily cut away by the molten iron. The cleanings from the molding floors are generally added or a few shovels from the sand heaps, and in case it becomes too rotten a few shovels of new molding sand are mixed with it.

When the material contains so much cinder that it does not make a smooth bottom, a few shovels of burned sand from the heaps are put on top to give an even surface and prevent the molten iron coming in contact with the cinder and cutting the bottom. The bottom sand is generally wet with water, but some melters wet it with clay wash, to make it more adhesive and give it more strength to resist the action of the molten iron. A thick clay wash gives strength to a rotten sand when mixed with it, but it also increases the tendency of the bottom to cake and hang up, and it is better to improve the bottom material in the way above described and wet it with water only. The sand when wet is cut over and evenly tempered, and should be no wetter than molding sand when tempered for a mold.

The sand may be thrown into the cupola through the front opening, or may be thrown in at the charging door. but it is generally thrown in at the front, for it is more convenient to the material, and is also convenient for spreading it in the cupola. When the cupola is small the melter stands by the side of it and makes up the bottom by passing his arm in through the front opening, but when the cupola is large he goes inside, and his helper shovels the sand in as he wants it. The first sand thrown in is carefully packed around the edges with the hands to insure a tight joint. As the balance of the sand is thrown in it is spread evenly over the bottom in layers from 1 to 2 inches thick, and each layer is evenly rammed or trampled down until the required thickness of bottom is obtained, which is from 3 to 6 inches, according to the rise of the cupola. The desired pitch or slope for throwing the iron to the front is then given, and the bottom butted evenly and smoothly all over. The melter next goes carefully around the edges with his hands and feels for any soft spots there may be near the lining, and slightly raises the edges of the bottom around the lining to throw the iron off and prevent it working its way down between the lining and sand bottom. The bottom is then carefully brushed and smoothed off, and in small cupolas a bucket of thin clay wash is sometimes thrown in at the front and caught in the bucket as it runs out. This is called slushing the bottom, and is done to give a smooth, hard surface.

The sand bottom does not always remain impervious to the molten metal, but is sometimes penetrated or cut up and destroyed by it. in which case a leakage of molten iron takes place from the bottom of the cupola that is difficult to stop. Leakage of this kind may be due to springing of the bottom doors when charging and the cracking or loosening of the sand bottom around the lining. This can be prevented by placing more props under the doors to support them. Sand that has been used over and over in a bottom until it has become worn out and filled with cinder is readily cut up and converted into a slag by the molten iron, and it is only a question of the time occupied in running off the heat whether the bottom gives way or stands. When the bottom sand gets into this condition, it must be renewed by the addition of new sand, or the bottom covered with a layer of sand from the molders' sand heaps.

Molten iron will not lay upon a wet, hard substance, but will explode or boil and cut up the material upon which it is placed. If the bottom sand is made too wet, or rammed too hard, or rammed unevenly, the iron will not lay upon it, but will boil and cut up the sand until it gets down to the doors, which it will melt and run through. When a bottom cuts through melters frequently attribute it to the bottom being too soft ; and I have seen them take a heavy pounder and ram a bottom as hard as a stone. In these cases, if the sand was worked very dry, or the bottom was well dried out before any molten iron came in contact with it, it did not cut up or leak ; but if the sand was wet when the molten iron came down, boiling at once took place and the bottom soon cut through —and in such cases they generally cut through about every other day. In the sand bottom of a cupola we have the same elements to contend with, so far as molten iron is concerned, as we have in a mold ; and the sand should be worked no wetter, rammed no harder, and rammed as evenly as the sand for a mold. The sand should not be worked wet for a bottom, under the impression that it is dried out before the iron comes down, for the ashes of the shavings, wood, coal or coke cover the bottom soon after the fire is started, and protect it from the heat to such an extent that it is only dried to a very limited extent before the iron comes down upon it. Water may be seen dripping from a very wet bottom long after the blast is on. Even if it were dried out wet sand cracks when dried rapidly and should not be used. I shall not attempt to give any directions for stopping a leak after it occurs, for the time and place to stop a leak is when putting in the sand bottom ; and if all the remedies I have given for preventing leaks fail, then it is time to change the melter.

The pitch or slope given to the bottom to cause the molten iron to flow to the tap hole from all parts of the bottom has a great deal to do with the temperature of the iron and nice working of a cupola. When the bottom is made too low and flat molten iron lies in the bottom of the cupola and becomes dull. As the melted iron falls into this iron drop by drop it is instantly chilled and the iron when drawn from the cupola is dull. This effect is more marked in a cupola melting very slowly, and a low bottom may be the cause of very dull iron when a sufficient quantity of fuel is consumed to make very hot iron. A high pitch throws the iron from the tap hole with great force and spouting velocity, and it is almost impossible to run a continuous stream from a cupola with such a bottom. It is more difficult to keep the tap hole and spout in order, and the stream must be closely watched to prevent it shooting over the ladle and burning the men. Slag flows freely from the tap hole with the stream of iron when the bottom has a high pitch, even when there is very little slag in the cupola. But the flow of slag from the tap hole with the iron may be entirely

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stopped by changing the pitch of the bottom, no matter how great the quantity of slag in the cupola. The action of the iron at the spout is entirely changed by the pitch of the bottom. A hard iron may be made to run smooth from the spout while a soft iron may be made to sparkle and fly, giving all the indications of a hard iron. The best expert on the quality of iron at the spout may be deceived in the iron by the pitch of the bottom, and it is only in the extremely hard and extremely soft iron they cannot be deceived. The bottom should never be made hollow in the center and high all around the outside with an outlet or trough to the spout. This concentrates the iron in the center in such a way that a few hundredweight places as great a pressure upon the front as a ton would do if the bottom were flat, and the front may therefore be forced out by a comparatively small body of iron. The instant the tap hole is open the iron rushes out with great force, and it is almost impossible to stop it as long as there is any molten iron in the cupola

The bottom should be made flat and level from side to side with only a slight rise around the lining, which should not extend out more than 1 or 2 inches from the lining. The pitch from back to front should not be more than ½ to ¾ inch to the foot. This has been found to be a sufficient slope to throw all the iron to the front in an ordinary cupola. But in cupolas that melt very slowly a little more slope may be given, so as to concentrate the iron more rapidly and prevent it chilling on the bottom.

In cupolas with two tap holes the bottom must be sloped so that all the melted iron in the cupola can be drawn from either tap hole. It is very difficult for a melter to see what slope he is giving a bottom when inside the cupola, and for this reason many of them seldom get the slope alike. The melter should be provided with a notched stick or some other gauge, for measuring down from the top or bottom of each tuyere, to serve as a guide in sloping the bottom, so it may be given the proper pitch and put in alike every heat.

New Enterprise Gas Range.

In appearance this new gas range, just brought out by Luther & Lederhos, 30 Cliff street, New York, so closely resembles an ordinary coal range that at a glance it might readily be taken for one. It has a cast iron body and is attractively ornamented. The range stands 26 inches high and has a top 31 x 26 inches with a pipe collar at one end and four 8-inch cooking holes. The oven is of sheet iron and is arranged with two side diving flues and one central return flue, all extending under the oven so as to heat it evenly. At the fire chamber end efficiency and economy have been grouped. Two pyramid coil burners, three tiers high, are placed here that have a capacity of 25 feet each, or either may be used and the consumption greatly reduced by reducing the supply. When in full operation baking is very promptly done, and a gallon of water is said to boil in 18 minutes in a vessel set over the burner. At the same time a broiler on the end opposite broils a chop quickly, and a water coil surrounding the burners is provided for heating water in the kitchen boiler, and which has on test heated 30 gallons in two hours. With this capacity but two valves are necessary to control the operation, and a large space is afforded by the top for articles that are cooking; the demand for such a space having been found in the gas stove market. A circular is issued by the firm with illustrations showing the range both with and without the broiler and water coil, and announcing that the first ranges will be ready for shipment after February 15.

ODD PLATES.

Sam S. Utter of 113 Beekman street, New York, has been doing a good business in oil and gas stoves, and he expects that his sales during 1894 will fully double those of last year. His establishment of agencies in the principal cities of the United States and Canada is referred to as having been the means of largely increasing his business.

We understand that the Kernan Furnace Company, Utica, N. Y., have recently increased their capital stock from $50,000 to $100,000. The notice of increase which appeared in these columns not long since had reference to an augmentation in capital which occurred last year.

The Bellaire Stove Company, Bellaire, Ohio, are making use of a sticker in the general shape of a legal seal, about 2 inches in diameter, which bears a very orignal sort of legend. The red paster is nicked at the edge in the orthodox fashion and on it in white letters are the words: "Solomon had 1000 wives. The Bellaire Stove Company have millions of them using their stoves and ranges."

John H. Welteroth, Williamsport, Pa., reports 1893 as a prosperous year, and has remodeled and enlarged his establishment to better display his line of stoves, plumbing and heating goods and meet the demands of his growing business, a feature of which is tin and sheet metal work. To facilitate his personal work he has fitted up a handsome private office and established a stenographer in it. He makes a specialty of the Howard hot air furnaces and the stoves of the Raymond & Campbell Mfg. Company.

The R. E. Dietz Company, 76 Fulton street, New York, are issuing a new edition of their cook book which, in addition to the receipts, shows the Dietz tubular heating and cooking stoves. The new steel fount lamp oil stove made with one and two burners with extension tops and ovens appears in the book for the first time. Another new stove is the Dietz new double cylinder gas heater. It has a star burner set over a gauze plate with a reflector beneath it. The heat of the stove is carried up the center of the stove to the top by means of an inner cylinder, which is perforated near the top, letting the heat escape to the outer cylinder of Russia iron. The outer cylinder is ornamentally perforated at the bottom and a few inches above, creating a continual current of air through the stove and keeping the air in the room in circulation, while a strong radiant heat is thrown off by the stove.

Isaac Brooke, one of the stove manufacturing firm of Floyd, Wells & Co., Royersford, Pa., recently sustained serious injury by falling down an elevator shaft at the works.

David Millar, formerly with the Boynton Furnace Company, is now the furnace expert of W. M. Mackay, manager of the New York house of Hart & Crouse of Utica, N. Y. The merits of the Royal hot air furnaces will be presented to the dealer and invitation extended to examine the line of samples at 211 Water street, New York.

H. Gilbert Hart of Hart & Crouse, Utica, N. Y, manufacturers of the Royal line of heating apparatus, has been visiting the heating trade in the West, and met W. M Mackay of the New York house at Chicago, visiting that trade together.

The J. D. Smith Foundry Supply Company, Cincinnati, Ohio, are making use of a novel style of letter head. It has the appearance of a small pamphlet entitled "The Radiant," issued at Cincinnati every month, the specimen number before us being Vol. I, No. 4. The first page is blank, excepting the heading, intended for ordinary letter purposes; the second page contains a collection of witty sayings and other interesting matter, while the third and fourth pages direct attention to several of the specialties of the J. D. Smith Foundry Supply Company.

The resumption of all the departments of the foundry plant of the Littlefield Stove Company, New York, was delayed by the illness of the foreman, John G. Watkins, but all departments are now running. The works have given employment to 125 men and these include molders, finishers and nickel platers. The plant will be run on full time as long as trade conditions permit. Treasurer Henry C. Littlefield of the company says that he can see no bright prospects as long as the tariff question remains in an unsettled condition. The company were compelled to begin work as the stock on hand had become depleted. No reduction in wages has been made nor do the company intend to make any unless forced to by unforeseen circumstances.

The Huette-Barler Mfg. Company of Chicago have changed the name of the corporation to the A. C. Barler Mfg. Company. The company manufacture the well known Barler's Ideal oil heater at 111 and 113 Lake street.

The Minneapolis *Commercial Bulletin* observes that the stove trade in that section is quiet, the short trade of the fall and early winter not having created a supplemental winter trade. The fall demand developed the fact that in many instances—enough in total to materially affect the trade—kitchen ranges were made to do duty for heater and range combined, thus saving on the first cost of stoves and fuel.

Reports from Indianapolis, Ind., are to the effect that the Indianapolis Stove Company of that place are running full time and giving employment to 90 hands.

The Enterprise Stove Company, with works located at Vincennes, Ind., have resumed operations with a large force.

The Chicago & Erie Stove Company of Erie, Pa., have issued a four-page folder, printed in colors, giving selections from numerous letters received from their customers relative to the successful operation of the Superb Helper steel ranges in different parts of the country with various kinds of fuel. The letters are very complimentary, and the manufacturers cannot feel otherwise than gratified at the success with which their goods are meeting.

The Peninsular Stove Company of Detroit, Mich., have issued from the press some attractive little folders, relative to their Rival Peninsular and

Welcome wood cook stoves, which have become popular among the dealers. The Rival Peninsular is made in seven sizes, with ovens, ranging from 18 x 12 x 12 inches up to 24 x 27 x 14 inches It is referred to by the manufacturers as a perfect baker, attractive in design and low in price. The Welcome four-hole wood cook is made in five sizes, and has among other features large flues, heavy covers, patent oven door opener and nickel trimmings.

In referring to the organization of the Board of Directors of the Buckwalter Stove Company of Royersford, Pa., last week, a slight error occurred with regard to the office of Mr. Staufer. It should have been given as superintendent instead of secretary and superintendent. The corrected list of officers, therefore, reads as follows: J. A. Buckwalter, president; I. N Buckwalter, vice president; R. E. Springer, secretary; T. D. Buckwalter, treasurer, and William M. Staufer, superintendent.

A somewhat massive souvenir comes to us from the Troy Nickel Works, Troy, N.Y., makers of the famous Alaska stove trimmings. It is an herculean key, nearly 8 inches in length, and is decorated with the legend, "Troy Nikell Wurx Offis Kee." Before reading the inscription we thought very likely it was a replica of the key to their success, which naturally would be of more than usual dimensions. However, we have no wish to put any false interpretation upon it, for we choose rather to regard the gift of an office key as another expression of that charming custom known as leaving the latch string on the outside of the door. We are grateful for the implied hospitality.

The Quick Meal Stove Company, St. Louis, Mo., are sending out to their customers a rubber stamp for use on their letter heads, bills, envelopes, &c. The stamp has the dealer's name and address, and also the following, "Quick Meal Gasoline Stoves," with their well-known trade-mark in the center. The idea is a good one, and will doubtless benefit the dealer as well as the Quick Meal Stove Company.

The stove works of Orr, Painter & Co., at Reading, Pa., resumed on January 31, full handed, giving over 400 men employment.

It is reported that the Fair & Day Foundry Company will add a stove works to their plant at Knoxville, Tenn.

The Bridgeport Stove Works Company is the new name of the works that have been operated by Lowman Brothers, at Bridgeport, Ala.

George H. Barnour of the Michigan Stove Company, who has been so active in the work of caring for the unemployed at Detroit, undertook the management of a grand charity concert at Detroit, Thursday evening, February 1.

The Quincy Steel Range Company, Quincy, Ill., issue an illustrated catalogue and price-list of steel ranges of their manufacture. The first ranges noticed are the Steel Jewels, made for hard or soft coal, wood or coke, in various sizes and styles. Five different illustrations show the various styles. In describing the Steel Jewel, they say that the oven, body and flues are of cold rolled sheet steel of No. 14 gauge. The tops, doors, panels, grate and liners are of the best Bessemer pig iron. High closets and shelves are of Wood's planished iron, the flues are lined with asbestos, the doors and panels are nickel plated and shaking and dumping grates for wood or coal are provided. The Noxall ranges are likewise made for hard or soft coal, wood or coke, Illustrations show their general appearance and brief descriptive particulars are given.

Bramhall, Deane & Co, 79 to 83 Market street, Chicago, have been succeeded by Deane, Huot, Brooks & Moncuse Company, who will continue to manufacture Bramhall, Deane & Co.'s and Duparquet, Huot & Moneuse Company's wrought iron ranges and broilers Their line also comprises carving tables, coffee and tea urns, copper and iron jacket kettles, steam roasting ovens, copper, tin and iron cooking utensils, bake ovens, &c., for use in hotels, institutions, restaurants and steamboats.

The Palermo Mica Company, 27 Peck slip, New York, issue in an attractive form their 1894 price-list of selected mica. It is a folder, black on the outside and orange color within, with a satin loop in the corner. In sending it to the stove manufacturers and jobbers the company announce that they have greatly improved facilities at their mines for carefully handling mica, and as their business is exclusively in mica, they are able to give it undivided attention. They call attention to their assortment of assorted packages, put up particularly for the retail trade. The particulars of these assortments are printed in silver ink on the back of the circular. Accompanying the list is a card announcing S. T. Peckham as sales manager of the Palermo Mica Company.

We are indebted to the Twin Burner Vapor Stove Company, St. Louis, Mo., for their 1894 price-list and catalogue. In presenting this volume to the trade they announce that they have attained the object which has been sought by gasoline stove manufacturers for years—namely, a vapor stove upon the evaporating principle that will fill all requirements for cooking purposes and one that is simple and easily managed and understood. This stove is the Twin Burner Process, which has no internal mechanism, no drip cups or parts to rust out, and the stove is open to inspection. They are claimed to work perfectly in cold weather, the needle points of the valves being German silver, not corroding and always insuring a steady drip. They are also supplied with sight glasses to each valve, through which the dripping of the gasoline in feeding the burner can always be seen. They call attention in particular to the fact that the coming season all their Twin Burner junior stoves will be made with lay down tank, and no extra charge will be made for the convenience. The pamphlet shows a large number of their Twin Burner stoves of various sizes and capacities. Some 16 pages are given to illustrations and price-lists of the goods. At the close are some instructions for the care of stoves and notice of miscellaneous gasoline goods.

A neat little pamphlet is issued by W. W. Lawrence & Co., Pittsburgh, Pa., entitled "Points on Putty." It is justly observed on the front cover that "the points in this primer will not make you rich, but may save you from annoyance and trouble." A great deal of serviceable information is contained in this little book of a dozen pages. Incidentally, of course, attention is directed to the goods of Messrs. Lawrence & Co.

Trade Notes.

We are indebted to A. Mugford, Hartford, Conn., for a pamphlet of sample engravings that he has made. The work done by him is of a high character, as shown in the specimen illustrations, which include cuts of machinery, Heating Boilers. Lathes, Bicycles, Radiators, Stoves, &c. Among the specimens presented in the volume are the goods of several firms with whom our readers are familiar, such as the Buffalo Forge Company, the Raymond & Campbell Mfg. Company, Jarecki Mfg. Company, Curtis & Curtis and the Richmond Stove Company.

We understand that D. R. Brownlow, Middletown, Conn., has invented a Curling Iron Heater, which he describes as a new device for heating a Curling Iron over a lamp chimney or gas jet without smoke or collecting lamp black. We are informed that capital has been raised for the manufacture of the article.

In our issue of January 20 we stated, by mistake, that Harvey L. Blank was to start in business for himself. The facts of the case are that H L. Blank, the junior member of Blank & Son, Pottsville, Pa., is connected with the Minersville Brass Works of Minersville, Pa., in the capacity of manager. This plant, however, is not yet in operation, and the machinery is only now being put in place. The company will manufacture supplies for steam and hot water fitters, plumbers and building hardware.

The building at 63 and 65 South Canal street, Chicago, partially occupied by the Chicago Clothes Dryer Company, was destroyed by fire on the 29th ult. The company's loss is stated at about $15,000. They manufacture a patented heating apparatus for drying clothes as rapidly as they are laundried.

The Lockport, N. Y., Indurated Fiber Company expect soon to increase their force of employees by 100 additional men. This is due to the closing of the branch works of the company at Portland, Maine.

The Star Baker Company, Belleville, Ohio, have completed a new building 30 x 40 feet in size, two stories high, especially adapted to the requirements of manufacturing Roasters and Bakers. The entire building will be used for the manufacture of the Columbia Roaster and Baker exclusively. We are advised that their increased facilities will enable them to make especially low prices on the goods.

The Portland Tinware Company, Portland, Maine, held their first annual meeting on January 16, at which L. W. Bradstreet was elected president and J. W. Davis treasurer. The company report that the year's business was a satisfactory one. They employ from 15 to 20 hands.

On another page of this issue J. W. Bell & Co., Mercer, Pa., are directing attention to the Wire Eave Trough Hanger which has been on the market for some eight years. The manufacturers inform us that the sales have been increasing steadily since it was first offered to the trade, and that it is now handled by over 60 of the leading jobbers throughout the country. The business for 1894 has thus far been satisfactory and the prospects for the coming year are hopefully regarded. The hanger is made in nine sizes and troughs of almost any make from 3½ to 7 inches in width can be fitted.

TRADE REPORT.

The Iron Market.

During the past week the improvement in certain branches of the Iron trade has gained further headway and a far more cheerful tone prevails. Buyers have taken hold, and it looks as though some of them have already missed their best opportunity.

The past week has been very active in Western Steel markets. The low prices made on Steel Billets—$15, Pittsburgh, having been undoubtedly done in a few cases—and the heavy demand in the Wire trade have led to heavy purchases of Billets and a large volume of inquiries.

In Foundry and Forge Irons there is a better feeling so far of volume of business is concerned, but prices are still very weak and it will take quite large sales before an improvement sets in.

In the Wire trade a stiffening in prices has taken place, as the result of large orders, induced obviously by the very low prices. Wire Nails have sold at Western factories, in large blocks, at the extraordinary price of 90¢ a keg. Now $1.05 is being asked by some makers. It is stated that two mills alone have orders for close on to 500,000 kegs on their books. Greater activity is also spreading in the Barb Wire trade.

An interesting item is the capture by the American Tube & Iron Company of an order for 60 miles of Wrought Iron Line Pipe for the Ontario Natural Gas Company. It may be remarked in this connection that the Canadian Iron markets are worthy of close study by our mills. The Dominion trade generally stocks up in the fall until the next spring, so that little could be done until now. But the time is now approaching when a vigorous campaign in Canada might lead to some good contracts.

Pig Iron.—Inquiries in the New York market are somewhat better, and the volume of business has increased, although it has needed the aid of concessions in some grades to stimulate orders. Efforts to contract beyond July for standard brands are cropping up, but are not meeting with any encouragement. Little has been done in the Cast Iron Pipe market, the Quincy, Mass., order going to the Radford foundry at $22.56, delivered. We quote standard brands $13 @ $13.75 for No. 1; $12.50 @ $13 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $13.50 for No. 1; $11.75 @ $13 for No. 2; $11.50 @ $12 for No. 3; $11.25 @ $12 for No. 2 Soft, and $12 @ $12.50 for No. 1 Soft

A fairly active demand for Pig Iron is reported from the Philadelphia district, and in some cases lots of considerable size have been taken, but on the average it has probably been at some slight sacrifice in prices. There is a conviction, however, that low prices have come to stay, so that when a desirable order is on the market there is a disposition to take it without regard to a few cents per ton from ruling quotations. General quotations are about as given herewith; but it would be a little misleading to suppose that any large amount of business is done at the outside figure. As a matter of fact, the heaviest end of the business is at the inside figure, or very close to it, and in special cases even the inside figure can be shaded a few cents per ton. For Philadelphia and equivalent deliveries quotations range about as follows:

No. 1 Foundry	$13 00 @ $14.00
No. 2 Foundry	12.50 @ 13.25

Advices from Chicago report that business in local Coke has been a little better. More orders were taken than during the previous week, and inquiries continue to come in from new directions. Consumers, however, are not at present inclined to anticipate their requirements more than for a month ahead, so that orders are largely for immediate shipment. Prices have been slightly reduced, as will be seen by the quotations below. Southern Coke Iron is also moving in small lots only and prices are a little weaker, also leading to revised quotations. Quotations are given as follows, for cash :

Lake Superior Charcoal	$15.30 @ $15.50
Local Coke Foundry, No. 1	12.50 @ 13.00
Local Coke Foundry, No. 2	12.00 @ 12.50
Local Coke Foundry, No. 3	11.75 @ 12.00
Local Scotch	13.00 @ 13 50
Ohio Strong Softeners No. 1	15.00 @ 15.50
Southern Silvery, No. 1	@ 13.75
Southern Silvery, No. 2	@ 13.25
Southern Coke, No. 2	11.50 @ 11.65
Southern Coke, No. 3	11.00 @ 11.50
Southern, No. 1, Soft	11.50 @ 11.65
Southern, No. 2, Soft	11.00 @ 11.50
Tennessee Charcoal, No. 1	16.00 @ 16.50
Tennessee Charcoal, No. 2	@ 15.00
Alabama Car Wheel	18.00 @ 18.50
Jackson County Silvery	16.00 @ 16.50
Other Ohio Silvery	15.00 @ 15.50

The past week showed no improvement in the Pittsburgh Pig Iron trade, except that inquiries for Foundry were perhaps a little more plentiful. No. 2 Foundry Iron is looking up a little in demand, very little No. 1 being sold in this market. Quotations are as follows :

No. 1 Foundry	$11.75 @ $12.00, cash.
No. 2 Foundry	10.75 @ 11.00 "

There has been no increase in the volume of business in Pig Iron in Southern markets during the week, and no improvement in prices. There is, however, more urgency to sell Foundry grades and buyers could obtain concessions of at least 25¢ ℔ ton for both spot and forward delivery if they would make the bids. No. 2 Foundry is offered at $7.55, and No. 3 Foundry $7.25, f.o.b. Birmingham, deliveries to begin now and to continue during the next eight months, or the delivery would be made to meet the convenience of the buyer within that time. The fact is the market is in such a demoralized condition that in the absence of buyers it is difficult to say how low they might secure Iron. There is no demand for any considerable lots of Charcoal Iron, but there are small sales at previous prices. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$11.75 @ $12.00
Southern Coke, No. 2	10.50 @ 10.75
Southern Coke, No. 3	10.00 @ 10.25
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin—Although a revision of the rules went into effect at the opening of the year under which contract deliveries on the Metal Exchange were made to involve as small lots as 5 tons, thereby offering more inducement for consumers to purchase economically for future delivery, as well as offering greater inducement for outside speculation, the market remains in a flat condition. During the past week there has been more or less fluctuation in prices, with 20¢ the highest and 19.85¢ the lowest point. The highest price named is below the cost of importation of Tin, duty paid, but neither that nor the fact that ordinary trade requirements have made more of less impression upon spot stocks has stimulated business in the slightest degree. Consumers and dealers have purchased only as imperative wants dictated, while prices have averaged somewhat lower for prompt and near future deliveries. Spot and February delivery has been openly offered at 19 90¢ during the past few days, and *sub rosa* at a shade less, net cash terms. March delivery was publicly offered at 19.85¢. Subsequently 5 tons were sold at 19 75¢. Smaller quantities than 5 tons have been selling at proportionately low prices, Straits

Pig being quoted nominally at 21½¢, which is now quite the outside asking price for moderate quantities from stock. On the whole, the market has shown poor form during the week.

Copper.—No improvement is noticeable in purchases of Lake Superior Ingot, and the demand, to all accounts, is still on a very moderate scale. Leading producers do not appear as urgent sellers, but offerings of moderate quantities from one source and another have had sufficient weight to keep prices rather weak. At the present time 10¢ is doubtless an extreme high rate. In fact, moderate quantities of the metal are available at a shade less, ordinary terms of sale, while speculators offer at as low as 9¾¢ for March and later deliveries. For small lots of Lake Superior Ingot jobbers ask 11¢, but this price is liable to shading under favorable circumstances. Electrolytic is unsettled, with prices at low range. Casting stock has been in somewhat better demand, and these brands are the steadiest of all in regard to price, sellers at less than 9.35¢ being now very few, while 9.40¢ @ 9.50¢ is generally asked for best brands in round lots, with an advance of ¼¢ @ ¾¢ on small jobbing quantities. The demand for manufactured Copper, although slightly better, still remains considerably below normal for this season.

Pig Lead.—There has been an advance of about 0.7½¢ on actual sales, 3.25¢ having been paid for carload and larger lots. That price was subsequently bid for additional parcels and refused. Holders are now generally asking 3.30¢ for prompt and forward shipments. The stronger tone is due chiefly to livelier business at Western points, including 25 carloads or more very recently at about 3.05¢ in East St. Louis. Eastern consumers are still very cautious buyers and neither jobbers nor speculators have manifested active interest in forward deliveries despite the movement in the Western market.

Lead Pipe and Sheet.—The demand for these materials exhibits little improvement, and jobbers complain of almost unexampled dullness in this branch of trade. Prices are inclined to weakness.

Spelter.—Prices have turned somewhat for the better and 3.60¢ @ 3.65¢ seem now to be inside rates for ordinary Western brands, as against fairly free offering at 3.50¢ @ 3.55¢ a week ago. Sales here have been moderate and the demand has shown little, if any, improvement, but business at primary points is reported as being livelier, which, together with some reduction in output latterly, seems to be chiefly accountable for the advance. Asking prices for small lots of Western Spelter from stock have advanced to 4¼¢, yet ¼¢ less than this may still be obtained in some quarters.

Antimony.—The jobbing trade has been of fair proportions and sufficient to keep the market steady at 10¾¢ @ 11¢ for Cookson's, and 10¼¢ @ 10½¢ for Hallett's, in small lots.

Aluminum.—The following are current quotations: No. 1 Aluminum, over 98 % pure, 75¢ ℔ lb in small lots; 68¢ ℔ lb in 100-lb lots; 65¢ ℔ lb in ton lots; No 2 grade, over 94 % pure, 73¢ ℔ lb in small lots; 65¢ ℔ lb in 100-lb lots, and 60¢ ℔ lb in ton lots. A reduction in list prices of manufactured Aluminum is noted in another column.

Tin Plates.—A somewhat better business is noted in orders for forward deliveries, but it has been of a fitful character and due, perhaps, to exceptional causes. Low prices have ruled in nearly all instances where round lots were involved, and there is no appearance of any decided improvement in the market. Business has been, on the whole, decidedly disappointing. Orders for spot goods are confined almost entiely to moderate quantities for the supply of immediate needs. But even these are sometimes found difficult to fill where an assorted lot of Plates is required, so low have jobbers' stocks run down. Never before, it is said, was there so much "hunting round" going on in order to beat up trade, and with such slim results. Prices are soft all along the line, particularly in Roofing Plates, the demand for which is much below the average, even for the present off season of the year. In fact, absolute prices are not really quotable, as they depend entirely upon size and desirability of order and the presssure or otherwise to sell; but it may be safely said that concessions on quoted rates may be almost invariably secured, particularly on cash orders.

A London cable dispatch of January 31, 1894, to *The Iron Age* reports that business in the British Tin Plate market has been small and the demand apiritless. There has been hardly any change in prices during the week. Stocks of Tin Plates at Swansea are about 260,000 boxes. Liverpool prices are quoted as follows:

IC Charcoal, Alloway grade	12/3 @ 12/9
IC Bessemer Steel, Coke finish	11/ @ ....
IC Siemens " " "	11/3 @ ....
IC Coke, B. V. grade, 14 x 20	11/ @ ....
Charcoal Terne, Dean grade	10/6 @ ....

Sheet Iron.—There has been more inquiry for Black Sheets, especially those of light gauge for tinning purposes, the demand for these latter exceeding the supply. Otherwise business is dull and prices low and irregular. Galvanized Sheets are in good supply and fairly steady in price, but the demand is only of moderate proportions. Makers hope, however, for a stimulation of business as spring approaches.

Fire on January 26 destroyed one of the buildings of the Indiana Mfg. Company's works, Peru, Ind., together with its contents, consisting of finished Refrigerators. The loss is said to be covered by insurance.

Chicago Report.

Scrap.—Cast is in fair demand, but all kinds of Wrought are very quiet. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per ℔
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	7.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—There was a little spurt for a few days during the cold snap, but trade has fallen off again. Carload lots of 12 net tons or over are nominally quoted as follows, but these rates can be shaded about 50¢.:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

The Pittsburgh Brass Company of Pittsburgh, with works in Allegheny, Pa., have been placed in the hands of a receiver. In regard to this action, we are advised that a judgment was entered against the firm because of the uncalled for action of a very small stockholder, who was endeavoring to hamper the management for purely personal motives, and it was feared by the officials of the firm that his action might be misconstrued and lead to action on the part of some creditors, which might jeopardize the interest of others and of the stockholders as a whole, and that under the circumstances the rights of all parties would be best conserved by placing the concern in the hands of a receiver. Application was therefore made, and Jos. McNaugher, vice-president of the company, was named by the courts as receiver. The business will be conducted as usual, and it is believed that all claims will be satisfied within a short time. The good assets of the company are stated to be not only considerably in excess of outside liabilities but of the entire capital stock as well, amounting to $250,000.

CONDITION OF THE

Hardware Trade.

REPORTS RECEIVED from the trade generally agree in referring to the improved condition of business. There is certainly in many lines an increased demand, and in general Hardware the trade are beginning to place orders more freely than for some time. The volume of business is, however, only moderate, but the fact that it is increasing is an excellent indication and all that can be expected under the circumstances, inasmuch as the gradual improvement and return to normal business conditions is all that can reasonably be looked for. In the matter of prices it is noticeable that there is apparently a slight reaction from the extremely low figures which have ruled on some staple goods. In the general line of Hardware the market is not strong, and the effect of low raw material, reduced wages and dull business is shown in the prices on some goods. The influence, however, of diminished production in relatively increased costs is felt, and with a moderate volume of business manufacturers find that they cannot produce goods as cheaply as when running to their full capacity. They are also scrutinizing their costs closely and are more careful than has been their wont to secure remunerative prices. The financial condition is certainly more satisfactory than for a long time, and February, on the whole, opens with a brighter outlook than any month during the past half year.

Advices from Chicago.—The Shelf Hardware jobbers report a steadily increasing trade. The bulk of this business is still in the line of orders for future delivery for seasonable goods and for stocks of staple goods. Country merchants are becoming convinced that staples may be higher and are buying as though they believed an advance was imminent. Their orders are consequently more numerous and heavier than for a long time and carry with them some straight Hardware for sorting up. Some large jobbing houses are reporting good trade in regular Hardware, but it is shrewdly surmised that the business thus secured is at the expense of prices. The heavy Hardware trade is spasmodic, days of excellent business being followed by periods of dullness. The general average, however, shows an improving condition of affairs, which will undoubtedly gain in strength as spring approaches.

Notes on Prices.

Wire Nails.—The Wire Nail market is evidently in an improved condition, both in the matter of demand and prices. The manufacturers have recently been booking many orders, some of them large, and as a result the mills are well occupied. They are also receiving many inquiries, and orders continue to come in in good volume. Buyers are evidently attracted by the low prices ruling, and the improved tone of the market is likely to have the effect of making them desirous of placing their orders before a more definite advance in prices is made. In this condition of things the market has naturally assumed a stronger tone, and manufacturers refuse to accept orders at prices which were quoted a short time ago. The market continues to be represented by the quotation of $1.10, from which price a concession of 5 cents is made on large and attractive orders. During the past week some large orders have been placed at $1, but this is regarded as the lowest price obtainable, and it is one which some manufacturers refuse to meet. Manufacturers are anticipating a continuance of the demand for the next month or two, and refer to the probability of an advance in prices. The New York market is represented by the quotation of $1.20 on dock, and small lots from store are held at $1.25 to $1.30.

Advices from Chicago.—Prospects are very bright for an unusually heavy business in Wire Nails in at least February and March. A great many buyers are in the market, and among them are some very large houses whose requirements for the spring have not yet been covered. Makers are greatly encouraged by the increase in inquiries and are advancing their prices. Quotations on factory lots are now $1.20 to $1.25, Chicago, and more than one factory is stated to be so well sold up as to be practically out of the market. Jobbers are quoting $1.25 to $1.30 from stock, but an advance may be expected at any time in consequence of the heavy demand.

Cut Nails.—The Cut Nail market, under the influence of the same causes that affect Wire Nails, is in a somewhat improved condition. Trade, without being especially active, shows evidence of a decided increase and prices are also somewhat firmer without being quotably higher. The Western market is represented by the quotation of $1 to $1.05 at mill. The Eastern Cut Nail manufacturers are adhering closely to the agreement in regard to discontinuing quotations at factory, and are naming only prices for Nails delivered. The New York price is $1.05 for carload lots on dock, with the usual advance on small lots from store.

Advices from Chicago.—Business in Steel Cut Nails grows better steadily, and while orders have not been so large as in past years, they are coming in more frequently. Merchants find it necessary to replenish stocks faster than they had expected. This is leading to inquiries for larger quantities. Prices here on factory lots are now $1.05 for a 60-cent average. Jobbers quote small lots from stock at $1.20 to $1.25.

Barb Wire.—An increased activity is noticeable and manufacturers refer to the fact that they are receiving many inquiries, which leads them to anticipate an active trade during the next few weeks. Prices remain in substantially the same condition as a week ago, some manufacturers holding carload lots of Galvanized Four Point at mill at $2.10, while from others the Wire can be obtained at $2. The tone of the market is, however, a little stronger and manufacturers show a disposition to withdraw extreme quotations.

Advices from Chicago.—The inquiry for Barb Wire is very much heavier from merchants through the West. They have held off so long that they are now finding themselves obliged to buy just as they need the goods. Large buyers report that factory prices have stiffened here at least $1 per ton. Prices have also been advanced $3 to $4 per ton on shipments south of the Ohio River. The trade is looking for a further advance at an early day if the present volume of business keeps up. Carload lots of Galvanized are quotable at $2.20 to $2.25, while small lots from stock are selling at $2.30 to $2 40.

Bright Wire Goods.—The prices of Bright Wire Goods are somewhat uneven, and with the active competition between the manufacturers prices are low, the discount of 90 per cent. being readily obtainable.

I X L Scale.—The I X L Scale, manufactured by the Southwark Scale Company, Philadelphia, Pa., is sold at a discount of 50 per cent. from their revised list prices.

Tack Hammers.—The Ladies' Perfect and Alaska Tack Hammers, which are manufactured by the Troy Nickel Works, Troy, N. Y., are sold at a list price of $44 per gross, subject to the following discounts:

	Per cent.
Ladies' Perfect	25 and 10 and 10 and 10
Alaska	55 and 5 and 2½

Enterprise Coffee, Spice and Drug Mill.—The Enterprise Coffee, Spice and Drug Mill, an illustration of which was given in our last issue as manufactured by the Enterprise Mfg. Company of Philadelphia, Pa., is sold at $3.50 each, from which a discount of 20 per cent. is allowed.

Gibbs Mfg. Company.—Gibbs Mfg. Company, Canton, Ohio, are quoting the following net prices on their line of Lawn and Garden Rakes, Post Hole Diggers, &c.

Lawn Rakes.

	Per doz.
The Gibbs	$4.90
Gibbs' Canton	3.75
" Favorite	3.90
" Acme	4.75
" Crown No. 1	4.90
" Crown No. 2	5.30
" Hustler No. 0	4.25
" Hustler No. 1	4.40

Garden Rakes.

	Per doz.
Gibbs' Boss No. 14	$2.95
" No. 18	3.10

Post Hole Diggers.

	Per doz.
The Gibbs	$12.75
Gibbs' Columbia	12.00
" National	12.00
" Hustler	10 00
" Imperial	7 50

Lawn Sprinklers.

	Per doz.
Gibbs' Arc	$12.00
" Hustler	6.00

Curry Combs.

	Per doz.
Gibbs' Magnetic	$2.00

Wringers.—The National Wringer Mfg. Company, Canton, Ohio, have issued a catalogue of Wringers on which the following net prices are quoted, terms 60 days, subject to a discount of 2 per cent. for cash in ten days, delivered to any part of the United States:

No.	Per dozen.
20, Erie, 10 inch	$23.00
30, " 11 "	26.00
55, King, 11 "	27.00
2, "77," 10 "	15.50
2, Zenith, 10 inch	16.50
3, " 11 "	18 50
4, " 12 "	21.50
40, Prime, 10 "	20.00
50, " 11 "	23.60
66, Columbia, 11 x 1¾ inch	27.00
99, Pittsburgh, 11 x 2 "	30.00

Daisy Rat Traps, manufactured by the company, are subject to the same terms, and are sold at $10 per gross.

Shot.—Another decline in the price of Shot is announced by the manufacturers under date of January 29. Following are the revised prices, terms 30 days, or 2 per cent. discount for cash in ten days from date of invoice:

	Per bag.
Drop Shot, sizes smaller than B, 25 pound bags	$1.25
Drop Shot, sizes smaller than B, 5-pound bags	.35
Drop Shot, B and larger sizes, 25-pound bags	1.50
Drop Shot, B and larger sizes, 5-pound bags	.40
Buck and Chilled Shot, 25 pound bags	1.50
" " " 5-pound "	.40
Dust Shot, 25-pound bags	2.00
" " 5-pound "	.45

In lots of 2000 pounds and upward taken at one time a discount of 5 cents per bag (25 pounds) will be allowed, together with a special discount of 2½ per cent.

Aluminum.—The Pittsburgh Reduction Company have issued the following lists on Plate, Sheet and Wire Aluminum:

Aluminum Plate and Sheet, B. & S. Gauge.

Wider than ... / And including ...	3 in. 12 in.	12 in. 14 in.	14 in. 16 in.	16 in. 18 in.	18 in. 20 in.	20 in. 22 in.	22 in. 24 in.	24 in. 26 in.	26 in. 28 in.	Price per pound for polishing one side*
⅝ in. and heavier	$0.90	$0.92	$0.93	$0 94	$0.95	$0.97	$1.00	$1.05	$1.10	On
Nos. 00 to 8	.92	.94	.96	.98	1.00	1.05	1.10	1.15	1.25	applica-
Nos. 9 to 16	.95	.98	1.01	1.04	1.07	1.12	1.20	1.30	1.50	tion.
Nos. 17 to 20	1.00	1.03	1.06	1.10	1.15	1.20	1.30	1.45	1 55	2¢
Nos. 21 to 24	1.05	1.09	1.13	1.18	1.24	1 30	1.45	.....	.....	4¢
Nos. 25 and 26	1 10	1.15	1.20	1.25	1.32	1.40	.....	.....	.....	6¢
Nos. 27 and 28	1.15	1 22	1.30	1.40	.....	.....	.....	.....	.....	8¢
No. 29	1 20	1.30	1.40	1.50	.....	.....	.....	.....	.....	11¢
No. 30	1.25	1.35	1.50	.....	.....	.....	.....	.....	.....	13¢
										14¢

Not Wider than 6 Inches.

Nos.....	31	32	33	34	35 and 36	37 to 40	0.003 to 0.0015 in.	Less than 0.0015 in.
	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$4 00	$4.50

Aluminum Wire.—B. & S. Gauge.

Diameter. B. & S. Gauge.	Price per pound.
Nos. 9 to 14	$1.25
Nos. 16 and 17	1.28
Nos. 18 and 19	1.31
No. 20	1.40
No. 21	1.48
No. 22	1.62
No. 23	1.76
No. 24	1.96
No. 25	2.10
No. 26	2.27
No. 27	2.58

Elbows and Shoes.—W. Austen Obdyke & Co. and Lamb & Ritchie announce that in order to simplify and adjust prices, after February 1, 1894, their list prices for Corrugated Expanding Elbows and Shoes will be as follows, replacing all previous lists:

Round.

	Elbows.	Shoes.
2-inch, each	25¢	30¢
3-inch, each	30¢	36¢
4-inch, each	40¢	48¢
5-inch, each	50¢	60¢
6-inch, each	60¢	72¢

Square.

2-inch, each	30¢	40¢
3-inch, each	36¢	48¢
4-inch, each	48¢	60¢
5-inch, each	60¢	72¢
6 inch, each	72¢	84¢

In each of the above classes there is but one price now for each size.

Old Metals.—Old Metals are in very slow sale. The supply is much in excess of the demand, so that better prices are unobtainable. Holders, as a rule, are not anxious to dispose of material at the present low rates, and dealers are doing very little, nor are they anxious for business under present conditions. There is a moderate demand for some special kinds of Scrap Iron, required for export; otherwise the local market is lifeless. The following are the nominal prices paid by New York dealers for moderate sized lots:

Heavy Copper	℔ lb 7¢
Light and Tinned Copper	℔ lb 6¢
Heavy Brass	℔ lb 5¢
Light Brass	℔ lb 4¢
Lead	℔ lb 3¢
Tea Lead	℔ lb 2½¢
Zinc	℔ lb 2¼¢
No. 1 Pewter	℔ lb 13¢
No. 2 Pewter	℔ lb 6¢
Wrought Scrap Iron, ℔ gross ton	$7.00 @ $8.00
Heavy Cast Scrap, ℔ gross ton	7.00 @ 8.00
Stove Plate Scrap, ℔ gross ton	4.00 @ 5.00
Burnt Iron, ℔ gross ton	2.50 @ 3.00

Old Rags, Paper, &c.—The market for Rags and Paper Stock shows as yet little indication of improvement. The demand continues light, and prices weak. Those paid in the New York market are about as follows:

No. 1 White Rags	℔ lb 3¼ @ 3½¢
No. 2 White Rags	℔ lb 2¼ @ 2½¢
Mixed Rags	℔ lb ¾¢
Blues and 3ds	℔ lb 1 @ 1¼¢
Hard Sized White Shavings	℔ lb 2¼ @ 2½¢
No. 1 White Book Shavings	℔ lb 2 @ 2⅛¢
No. 2 White Book Shavings	℔ lb 1 @ 1⅝¢
Light Book Shavings	℔ lb ¾¢
No. 1 Mixed Shavings	℔ lb ¾ @ 1 ¢
No. 2 Mixed Shavings	℔ lb ½ @ ¾¢
No. 1 Printed Books	℔ lb 1 @ 1¼¢
Ordinary Mixed Books	℔ lb ½ @ ¾¢
Newspapers	℔ lb 2-5 @ ½¢
No. 1 Manila Paper	℔ lb 1 @ 1⅛¢
No. 2 Manila Paper	℔ lb ¾ @ ¾¢
Bogus Paper	℔ lb ½¢
Common Paper	℔ lb ⅜¢
Straw Chips	℔ lb ½¢
Binders' Clippings	℔ lb ½ @ ⅝¢
Jute Butts	℔ lb 1⅞ @ 2 ¢
No. 1 Jute Bagging	℔ lb 1 @ 1¼¢
Mixed Bagging	℔ lb ¾ @ 1 ¢
No. 2 Bagging	℔ lb ½ @ ¾¢
Hemp Twine	℔ lb 2 @ 2¼¢
Manila Rope	℔ lb 2¼ @ 2⅝¢
Jute Rope	℔ lb 1½ @ 1¾¢
Mixed Rope	℔ lb ¾ @ ⅞¢

Old Rubber.—The market for this material remains very quiet. New York dealers' prices are nominally as follows:

Car Springs, ton lots, ℔ lb	@ $0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb	@ .03
Rubber shoes, less than carloads, ℔ lb	0.02¼ @ .03⅛
Large Hose, ℔ ton	@ 9.00
White Wringer Rolls, ℔ lb	@ .04¼
White Syringes, ℔ lb	@ .05

ELTON W. CLARK of Merry & Clark, 535 to 547 West Fifteenth street, New York, importers and dealers in tin roofing plates, has returned to the city after a vacation of some three weeks, which he spent in Florida.

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CHICAGO, FEBRUARY 1, 1894.

Tin—
Straits pigs.....22½¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
	IC, 10 x 14.....@	$6.75
	IC, 12 x 12.....@	6.75
	IC, 14 x 20.....@	6.75
	IC, 20 x 28.....@	13.50
Galland and MelynGrade	IX, 10 x 14.....@	8.75
	IX, 12 x 12.....@	8.75
	IX, 14 x 20.....@	8.75
	IX, 20 x 28.....@	17.50
	DC, 12½ x 17.....@	6.50
	DX, 12½ x 17.....@	8.50
Allaway Grade,	IC, 10 x 14.....@	6.50
"	IC, 12 x 12.....@	6.50
"	IC, 14 x 20.....@	6.50
"	IC, 20 x 28.....@	13.00
"	IX, 14 x 20.....@	8.00
"	IX, 20 x 28.....@	16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔.....	@ 5.25
IC, 14x20, 100℔..5.50	@ 5.65
10 x 20.....	@ 8.50
20 x 28...11.30	@11.50
'X, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—

IC. 14 x 20 ...@	$5.62½
20 x 28.....@	11.25
IX. 20 x 28.....@	14.25

Worcester Brand and equal.—

IC, 14 x 20.. 6.12½@	.....
IC, 20 x 28..12.25 @	.....
IX, 14 x 20.. 7.62½@	.....
20 x 28..15.25 @	.....

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20.....	$7.00
" " IX, 14 x 20.....	9.00
" " IXX, 14 x 20.....	11.00
" " IC, 20 x 28.....	14.00
" " IX, 20 x 28.....	18.00
" " IXX, 20 x 28.....	22 00

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20..	$6.75
IX, 10 x 14, 12 x 12, 14 x 20..	8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20..	$7.00
IX, 10 x 14, 12 x 12, 14 x 20..	9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal ,extra, IC, 14 x 20.....	7.25
Merion, IC, 14 x 20.....	7.00
Almond, IC, 14 x 20.....	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood. -IC, 14 x 20.....	$6.00
" IC, 20 x 28.....	12.50

Roofing Plates.

Arch, IC, 20 x 28.....	@$11.50
Crescent, IC, 20 x 28.....	@ 12.25
Crescent, IX, 20 x 28.....	@ 15.25
Empire, IC, 20 x 28.....	@12.50
Empire, IX, 20 x 28.....	@15.50
Hickory, IC, 20 x 28.....	@ 12.75
" IX, 20 x 28.....	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28.....	@ 17.75
Special, IC, 20 x 28.....	@ 15.00
" IX, 20 x 28.....	@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28.....	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28.....	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28.....	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28.....	$23.60
Irondale A:	
IC, 14 x 20.....	$6.25
IX, 14 x 20.	7.75
IC, 20 x 28.....	12.50
IX, 20 x 28.....	15.50
Westmoreland:	
IC, 14 x 20.....	$6.25
IC, 20 x 28.....	12.50
Elwood:	
IC, 20 x 28.....	$12.00
Juno:	
IC, 14 x 20.....	$5.75
IC, 20 x 28.....	11.50
Illinois, Old Method:	
IC, 20 x 28.....	$17.00
E. L.:	
IC, 20 x 28.....	$12.50
Jessie:	
IC, 20 x 28.....	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28.....	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28.....	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20.....	7.50
" " IC, 20 x 28.....	12.50
" " IX, 20 x 28.....	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared).....	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared).....	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared).....	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared).....	16.50
Columbia, IC, 14 x 20 (Stamped)....	7.25
" IC, 20 x 28 (Stamped)....14.50	
Maple, IC, 14 x 20 (Stamped).....	6.75
" IC, 20 x 28 (Stamped).....	13.50
Willow, IC, 14 x 20.....	6.50
" IC, 20 x 28.....	13.00
Knoxall, IC, 14 x 20.....	6.25
" IC, 20 x 28.....	12.50
Globe, IC, 14 x 20.....	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20.....	6.00
" IC, 20 x 28.....	12.00
" IX, 20 x 28.....	15.00
" (Redipped), IC, 20 x 28.....	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28.....	$13.00	$13.00
XX, 14 x 28.....	14.50	14.50
X, 14 x 31.....	14.50	15.80
XX, 14 x 31.....	16.50	17.50

	Per box of 56 sheets.	
X, 14 x 56.....	29.50	16.50
XX, 14 x 56.....	32.50	18.20
X, 14 x 60.....	31.50	17.65
XX, 14 x 60.....	35.50	20.90

Sheet Iron—
Black.

	Common American	Refined.
Nos. 10 to 16.....	℔ 2 6-10¢	3 2-10¢
17 to 20.....	℔ 2 7-10¢	3 3-10¢
21 to 24.....	℔ 2 8-10¢	3 4-10¢
25 and 26.....	℔ 2 9-10¢	3 5-10¢
27.....	℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality. dis.70&7½@10%

Copper—
Ingot.

Lake.....11½¢ @ 12¢
Casting Brands.....10½¢ @ 11¼¢

Sheet and Bolt.

Discount, 30%.

Copper Bottoms.

Discount, 30%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...	35¢
Plain, above 3 inch.....	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch.....	60¢
Plain, 3-16 inch.....	$1.00
Plain, ⅛ inch.....	$1.50
Fancy Tubing, Brass, to No. 30 incl.....	43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass.....	

40 & 5%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter..... 5

Sheet Zinc—
600 ℔ casks..... 4¾¢
300 ℔ casks..... 5 ¢
Loose sheets..... 5¼¢

Lead—
Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12¢ @12½¢
Hallett's.....11¼¢@11¾¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain.....	60%
1¼ and under, Galv.....	52½%
1½ and over, Plain.....	70%
1½ and over, Galv.....	60%
Boiler Tubes, list Oct. 24, 1892.....	70%
Casing, list Nov. 16, 1892.....	52½%
Inserted Joints Casing, list Nov. 16, 1892.....	47½%
Steel Boiler Tubes.....	27½%
Cold Drawn Seamless Steel Tubing...	50%

Cast-Iron Soil Pipe—
Cast-iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—
Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—
Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—
Cushman's.....$1.35 square
Merchant & Co.'s Spanish Tiles:

Copper, 14 oz.....	$36.00 sqnare
Tin.....	$9.75@$14.25 square
Steel, painted.....	$9.00 sqnare

Drain Pipe—*Tile.*
Discount from list..... 70%

Paints Oils, &c.—
Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ D, 2 ¢
" " Brown.....℔ D, 1½¢
" " Purple.....℔ D, 2½¢
" Ground in oil, B. Red℔ D, 6½¢
" Ground in oil, Red..℔ D, 6½¢
" Ground in oil, Brown℔ D, 5½¢
" Ground in oil, Purple℔ D, 6 ¢
Linseed Oil, Boiled, in bbls.....52¢
Linseed Oil, Raw, in bbls.....49¢
Mineral Paints..... 2@4¢
Orange Mineral..... 9¼¢
Pure White Lead in Oil.....6@8½¢
Dry White Lead in bbls.....5½@5¾¢
Red Lead, American.....6@8½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ℔ gal..... 84¢
Spirits Turpentine, in bbls., ℔ gal.. 35½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, FEBRUARY 2, 1894

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal (guaranteed over 94% pure Aluminum), in ton lots..... ℔ D, $0.60
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ D .65
Lots less than 1 ton, 10¢ @ 12½¢ ℔ D additional.

Antimony—
Cookson.....℔ D, 10¾¢@11¢
Hallett's.....℔ D, 10¼¢@10¾¢

Brass—
Planished..... .....net
Roll and Sheet.....35@40%

Brass and Copper Tubes Brazed Brass Tubing—
List May 20, 1889.

	Per D.	
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive....	$0.35	35@40%
Plain, to No. 20, above 3 inch....	45	
Plain, 5-16 inch to No. 20.....	45	
Plain, ¼ inch.....	60	
Plain, 3-16 inch.....	1.00	
Plain, ⅛ inch.....	1.50	
Fancy Tubing to No. 20, inclu...	43	

Copper and Bronze Tubing—
3¢ ℔ D more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....	17¢ ℔ D
Over 3½ to 5 inches inclusive....	18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....	18¢ ℔ D
Over 3½ to 5 inches inclusive ...	19¢ ℔ D

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished. .....net
Sheet and Bolt. .....25&25&5%

Tubes — See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized..... .....35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—
Flat Crimp.

Tin.....35%
Galvanized..... .... 35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16....	℔ D, 2.70.....	3 ¢
Nos. 17 to 20	℔ D, 2 80....	3.10¢
Nos. 21 to 24....	℔ D, 2.90.....	3.20¢
Nos. 25 and 26..	℔ D, 3.....	3.30¢
No. 27.....	.....℔ D, 3.10.....	3.40¢
No. 28.....	.....℔ D, 3.15.....	3.50¢
American B. B....	.....℔ D,	4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12½¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ D, 8¾¢

Galvanized.

	B. B.	
Nos. 10 to 16.....		70&5%@70 &10%
Nos. 17 to 22.....		
Nos. 23 to 24.....		
Nos. 25 to 26.....		
No. 27.....		
No. 28.....		
Nos. 29 and 30.....		

Filter Joints—
Lee's..... .....33⅓%

Lead—
American Pig..... .....3⅞¢@4¢
Bar.....4¼¢
Pipe.....5¾¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2¾¢ ℔ D.

Metal Expanded—
Manufacturers' list No. 5.

Lathing.....	10%
Fencing, Painted Sheets.....	20%
Netting, Painted Sheets.....	20%
Door Mats, Galvanized.....	25%
Window Guards, Paneled.....	15%
Tree Guards, Paneled.....	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil.....	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls...	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American.....	1 @ 1¼
Red, Venetian, American.....	1¼ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans..... .01½ @ .02¼
In bladders..... .01¾ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¾	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.15@$1.16
Rosin, E. & F..... ₩ bbl. $1.30@$1.45
Rosin, G. & H..... ₩ bbl. $1.60@$1.80
Rosin, I. & K..... ₩ bbl. $2.20@$2.65
Rosin, M. & N..... ₩ bbl $3.10@$3.25

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50

Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔..... 3½¢
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
75¢ extra for keg. } 5% dis.
Kegs, about 55 ℔, ₩ ℔..... 4¢

Yager's Soldering Salts.
¼-℔ bottles, each..... 80¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢
Bertha (pure)..... 8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 22¢
Straits, pigs, ₩ ℔..... 21½¢
Straits in bars, ₩ ℔..... 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20..... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 6.00
" " IX, 14 x 20..... 7.00
Bonus, Extra Coated, IC, 14 x 20.... 6.75
" " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.87½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
DeMitt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 .....12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20 .....6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28 ..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20 ..... 6.75
" IX, 14 x 20 ..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28 ...12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20 ..... 7.00
Maple, IC, 14 x 20 ..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20 ..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... .....12.00
" IX, 20 x 28..... ....15.00
Neville, IC, 14 x 20 ..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20..... 5.60
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20 ..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20.....11.00
Merlon, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....$5.65
20 x 28.....11.00
IX, 14 x 20..... 6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20..... 5.50
20 x 28.....10.75
IX, 14 x 20..... 6.40
20 x 28.....12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.
Melyn and Cal-
land Grade. IC, 10 x 14.....$6.50
" " IC, 12 x 12..... 6.75
" " IC, 14 x 20..... 6.50
" " IC, 20 x 28..... 13.00
" " IX, 10 x 14..... 8.50
" " IX, 12 x 12..... 8.75
" " IX, 14 x 20..... 8.50
" " IX, 20 x 28.....17.00
" " DC, 12½ x 17..... 6.00
" " DX, 12½ x 17..... 8.00
Allaway Grade. IC, 10 x 14..... 6.00
" " IC, 12 x 12..... 6.25
" " IC, 14 x 20..... 6.00
" " IC, 20 x 28.....12.00
" " IX, 10 x 14..... 7.25
" " IX, 12 x 12..... 7.50
" " IX, 14 x 20..... 7.25
" " IX, 20 x 28.....14.50
" DC, 12½ x 17..... 5.50
" " DX, 12½ x 17..... 6.75

Coke.
Steel Coke.—IC, 10x14, 14x20 $5.40@$5.50
10x20..... 8.25
20x28.....11.50
IX, 10x14, 14x20..... 6.75
B. V. Grade.—IC, 10x14, 14x20..... 5.50

Imported Boiler Plates

IXX, 14x26..(112 sheets).....$13.35
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper ..... net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz.... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 5¢
Per ℔..... 5½¢

It Is Reported—

That Clement Hardy's Hardware store, at Richmond, Ind., was burglarized on the 19th ult. $50 worth of goods were taken.

That the contract for supplying the implements for use in the parks of Denver, Col., has been awarded to the George Tritch Hareware Company of that city.

That the Hardware store of Nathan Kenyon, Ionia, Mich., was burned out on the 20th ult.

That Henry Wallis has purchased an interest in W. D. Parker's Hardware store, at Sampton, Iowa. The firm will hereafter be known as Parker & Wallis.

That the T. B. Rayl Company, Hardware merchants, have been incorporated at Detroit, Mich. The capital is $60,000, of which $42,000 has been paid in. The incorporators are Thomas B. Rayl, Dudley W. Smith, Alexander Paton and James Wilkie.

That Lamb & Folsom have purchased the Hardware stock of J. W. Cole & Son, Dryden, Mich.

That the Hardware store of A. M. Avery, Pensacola, Fla., was burglarized on the 14th ult. A number of Revolvers, Saws, &c., were carried away.

That burglars broke into the Hardware store of A. B. Rathbone, Oakfield, N. Y., on the 16th ult. and blew open the safe. They got about $5 in small change. The Hardware stock was not disturbed.

That a certificate of incorporation has been issued to the K. J. Hoge Company, Wheeling, W. Va. The concern will deal in Hardware, Implements, &c. A capital of $30 000 is authorized. The incorporators are K. J. Hoge, G. M. Brown, William Rogers, L. J. Rogers and Arthur Rogers.

That Grier Bros.' Hardware store at Dubois, Pa., was destroyed by fire on the 11th ult.

That the Hardware store of John M. Chalfant, Kennett Square, Pa., was robbed on the 10th ult.

That Fred. S. Sterling has purchased the interest of his partner, H. C. Abell, in the Hardware and Tin business at Lowville, N. Y., and will hereafter conduct the store alone.

That the Hardware store formerly owned by Mason & Richardson, Cambridge, Iowa, has become the property of Willard & Co.

That E. Gordon, Hardware merchant, Sherwood, Mich., has nearly completed the erection of a new Hardware store.

That C. A. Tope and Wallace Beamer have bought the Hardware store of Tope Bros., Dell Roy, Ohio.

That M. F. Redmon has retired from the Hardware firm of Myer & Redmon, Osceola, Iowa, and has gone to Omaha, where he will be connected with the Avery Planter Company. Mr. Redmon's interest has been purchased by Ruby Myer, son of the senior partner, by whom the business was established in 1867.

That O. Gard has opened a new Hardware store at Fowler, Ind.

That M. Fishel has purchased the P. L. Barlow Hardware stock at Neosha, Mo., and has opened up for business at the old stand, with Mr. Barlow as manager.

That J. J. Rutka, who for many years was in charge of the Prusia Hardware Company's wholesale business, at Fort Dodge, Pa., is now engaged in the retail Hardware business at Grand Rapids, Mich.

That T. A. Murphy, Trenton, Mo., will re-enter the Hardware business about February 1. Mr. Murphy for the past two years has been Mayor of Trenton.

That the Hardware stores of H. Wilson and Nebo Hardware Company, Roodhouse, Ill., were destroyed by fire on the 14th ult. The losses are almost covered by insurance.

That L. L. Smith has concluded to discontinue the Hardware part of his business at Princeton, Iowa, and has moved his entire stock of Shelf Hardware to Allerton, where his principal store is located. He will, however, continue to retail Implements at Princeton as heretofore.

That the Lobeck-Linn Hardware Company, Omaha, Neb., held their annual meeting on the 9th ult. and elected the following officers for the ensuing year: C. O. Lobeck, president; C. H. Linn, vice-president; E. A. Pollock, secretary and treasurer.

That the Hardware store of Doak & Wolfe, Grenada, Miss., was badly damaged by fire on the 13th ult.

That W. E. Platner, for many years in the Hardware business at Mount Vernon, Iowa, has disposed of his stock to Messrs. Powers & Chambers.

That H. N. Askam has purchased a one-fourth interest in the Hardware and Implement store of Brobst & Porter Bros., Findlay, Ohio.

That John Schoutag has bought the Hardware stock of Amos Lamb, South Royalton, Vt.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, February 10, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND..... 312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Books as Helps.

It is a mistake to suppose that most practical men despise such knowledge as they can gain from reading. It would be more just to say that they welcome such books as are real helps. It is true that some whose educational advantages have been restricted are often discouraged and disgusted with books, because such as treat of the subjects they wish to inform themselves upon, and from which they have expected much, are written in a style not suited to their needs. Not being trained in mathematics, books, to be useful to them, must not be loaded down with mathematical discussions, no matter what may be their value to those who can understand and apply them. Mathematics has methods and a language of its own; and it is of no more use to one not conversant with its notation and skilled in its application than a German book would be to one who can read and speak only English. It is not just, on this account, for practical men to assume that the vast fund of knowledge existing in mathematical books is useless because unavailable to such readers. On the contrary, young men cannot be too strongly urged to pursue the study of mathematics, which opens the way to much that otherwise will forever remain inaccessible to them. Many a man bites off more than he can chew in the purchase of books. After getting a book he often finds, to his great disappointment, that the author has written for a different class of readers. Too many, thus disappointed, rashly conclude that books such as they need cannot be found and abandon the search. But it is rare in this age of printing that perseverance in spite of such disappointments will not discover books affording material help.

Exhaust or Plenum Ventilation.

Opinions still differ upon the choice of methods for forced ventilation. Some favor the method of exhausting the air from apartments to be ventilated, the impure air thus removed to be replaced by air flowing in from without under normal atmospheric pressure, others maintaining that the best way is the plenum method, in which pure air being mechanically forced into the space to be ventilated, forces out the impure air; while still others maintain that the latter method is not only the most effective, but that if the impure air be mechanically exhausted while pure air is at the same time mechanically forced in, thus combining the two methods, the results are better then than by either of the two former methods used by itself. Now, while good arguments in support of each of these methods may be forthcoming, it is a fact that neither of them gives uniformly good results under all conditions; and the suggestion is hazarded that under conceivable conditions and restrictions any one of these methods might be better than either of the others. Those who succeed best in erecting ventilating apparatus are such as, not slavishly wedded to any system, intelligently select their system on account of its adaptation to the peculiarities of the special case in which it is to be applied. Some very unwelcome results have followed rigid adherence to some of the modern systems, for which the energy and persistence of their promoters have secured adoption in buildings wherein they never ought to have found a place.

A Noble Example.

The story of the career of the late George W. Childs of Philadelphia is one that affords a splendid illustration of the possibilities which, in the United States, more than in any other country in the world, lie before every boy and youth who possesses in some degree the qualities which marked the dead philanthropist. Without any advantages of birth or education; by dint of sheer industry, integrity and perseverance, he rose from the humble position of office boy in a book store, at $2 a week, to one of the greatest eminence and influence among the private citizens of this country. While choosing to remain a private citizen he yet became the trusted friend and counselor of Presidents, statesmen and merchant princes. Mr. Childs with one hand amassed great wealth, every dollar of which was "clean money," and with the other hand dispensed it freely in deeds of beneficence and charity. The strict and transparent integrity which marked his entire career, combined with his tender hearted love for humanity, gained for him the universal esteem and affection which found expression in the glowing tributes to his memory which have been published since his death. Mr. Childs was a "self made" man in the best sense of the term, and his life should serve as an inspiration to generations yet to come.

Garbage as an Illuminant.

The disposal of city garbage is a subject which has offered a fertile field for discussion in the United States for many years. It would appear that the utilization of city garbage would be the more profitable consideration if we are open to availing ourselves of the experience of certain municipal authorities on the other side of the water. In Paddington, we learn, a London district which contains about 100,000 inhabitants, the garbage furnishes sufficient power to light all the streets of the district and at the same time reduces very materially the cost of the electric light for domestic use to the householders. About 30,000 tons of garbage are burnt annually, and, on experiment, it was found that three tons were equal to about one ton of coal in making steam, so that the garbage of the district is equivalent to 10,000 tons of coal annually for electric light service. A similar arrangement has also been tried successfully in the town of Southampton, England.

The Water Supply of Congress.

How many people, queries the Washington *Post*, know that out by the Greenough statue of Washington, east of the Capitol, is a vast and cavernous reservoir? Not one in a thousand, but there it is, down in the bowels of the earth, and covered deep beneath the smooth surface of asphaltum. Away back in the thirties Congress purchased a spring over east of the present site of Howard University. It is now at the bottom of the unused distributing reservoir. From it pipes were laid to the Capitol, and in a pond east of the building the water flowed and was held for the use of the early Solons of the hill. In 1876 the reservoir was arched over and covered in, but there it is, and if Congress has been neglectful of the city's interests as to a water supply, the reason is not hard to find. Congress has its own private tap. Pipes run into the Capitol, furnishing the boilers, coolers and water for cleaning purposes. There is an overflow pipe that runs into the pretty little grotto below the Senate wing at one side of the main sidewalk and tinkles over the mossy bank in a miniature cascade.

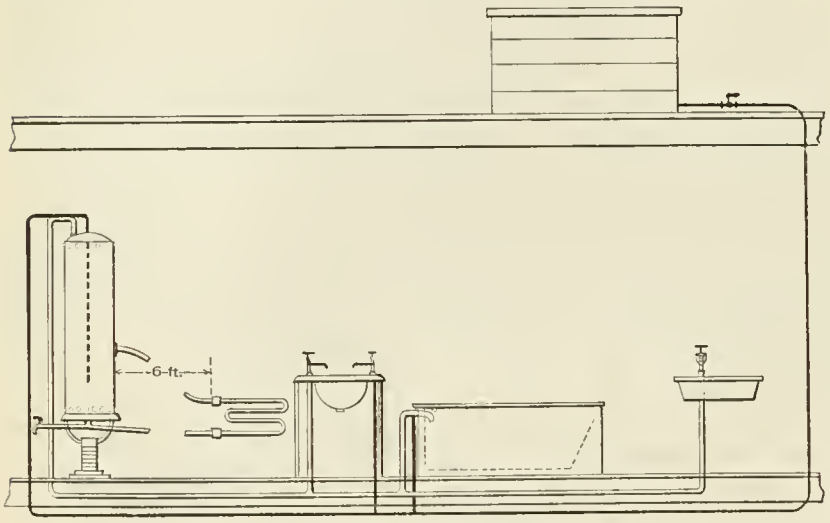
The New York Rapid Transit Commissioners have approved a plan for an underground railroad in the city.

THE LETTER BOX.

What Caused the Collapse?

From H. D., *New York*.—I recently set a range boiler which collapsed 18 hours after water was turned on and would like *The Metal Worker* and its readers to give their opinions as to what caused the accident. The boiler was a 40-gallon light weight copper boiler. Cold water was supplied by a ¾-inch lead pipe from a tank in the attic, the pipe running from tank to cellar and across underneath bathroom floor and tapped there to supply cold water to the bathtub and wash basin, as shown in the sketch. The boiler is in the corner of the bathroom and the supply pipe came up through the floor and connected to the center connection on top of the boiler in the usual way, with the tube inside of the boiler running down to within a short distance of the bottom of the boiler. The hot water pipe was connected to the top of the boiler in the usual way—to the coupling, about 4 inches from center. The boiler was connected by ¾-inch pipes to a double pipe water faucet. From the stove to the boiler is about 6 feet. The boiler was full of water when it collapsed, as the parties had been drawing hot water from the faucet in the kitchen shortly before it occurred. A rumbling noise was heard in the boiler a while before it collapsed. A natural gas fire, very hot, was burning in the stove and the water front is very close to the burner. The boiler, instead of being bulged out, as usually occurs when an explosion takes place, was drawn in all around the top just below where the top is riveted to the body, and looked as if a rope had been put around it and forcibly tightened up until it caved in. The boiler was full of very hot water, which spurted out of the hole made by the collapse. The top of the boiler sagged down with such force as to tear the lath from the wall where the tacks were screwed to them. The boiler must have been quite hot, for the color of the copper is changed at the top or the hottest part. I inclose a sketch showing the location of the fixtures. I am at a loss to tell what caused the accident, as I never saw anything like it in 13 years' experience, and am blamed by the customer for whom I did the work. The order for the range boiler and connections was filled by a traveling man, who is a plumber, he knowing what the parties wanted.

Note.—Our readers are again appealed to for information. It is quite possible the collapse was caused by steam in the boiler due to great heating capacity of the pipe water front and lack of pressure in the supply. From the top of the boiler to the level of the water in the tank, as shown in the illustration, would hardly be over 6 feet. Using the thumb rule of water pressure of ½ pound to each foot in hight, a pressure of only 3 pounds would be exerted at the top of the boiler by the supply. The large water heating surface exposed by the construction of the water front would enable steam to be generated freely and passed to the boiler. The accumulation of steam at the top of the boiler would drive the light pressure water supply back to the tank and would discolor the copper, as mentioned. Drawing off hot water at any faucet would let cooler water enter the boiler and pass to the water back, when the generation of steam would be stopped and the steam from the boiler would follow along the hot water service pipe, both actions tending to condense the steam and create a vacuum. If the vacuum was of considerable size it would not be filled with water before the atmospheric pressure of about 15 pounds to the square inch on the surface of the light copper boiler would cave it in. The trouble can be avoided in future by placing a vacuum valve at the top of the boiler to let in air when necessary or by running a relief pipe from the top of the boiler to the top of the tank and turning the end over the tank, but not into the water. This would let the steam escape and remove the cause of the collapse. Such experience is not unusual where the water pressure is no greater than would be with a tank placed so little above the top of the boiler.



What Caused the Collapse?

Roofing Queries.

From J. H. W., *Williamsport, Pa.*—The subject opened by "S. P. K.," in *The Metal Worker* of January 27, is a good one, for when a man knows the exact cost of his work he is not apt to cut prices below that mark, as has been done in many cases. We put our tin together in strips 20 inches wide, using 28 sheets to a strip or roll, and making four rolls to the box. The quality of the tin governs the time required to edge a box, the so called old style having lumps on the corners that must be removed before they enter the machine. The cheaper grades have raw edges and are not square, so that more time is required to prepare and edge them. My answer is based on average material and style of roof. A box of tin can be edged in 30 minutes. It can be put together with a mallet and soldered off before rolling up in from one and one-half to two hours. We lay no sheet-at-a-time flat seam roofing here, but put it on in strips. In soldering for standing seam about 2½ pounds of solder to the box is used, but for flat seam work 5 pounds. A fair day's work in standing seam roofing is about 500 square feet, and about 200 square feet of flat seam roofing when put on in strips, and about 5 pounds of solder to the box would be required to solder the seams. The edges of the roof are generally finished by cutting the tin 1½ inches longer than the dripboards, then bending it over and nailing it for flat seam work. For standing seam edges, the seams are flattened down with the lock on top so that the water can run out, the edges trimmed and bent down and nailed the same as flat seam work. Now let some other roofer give his account of getting the tin ready and putting it on, How about painting it? How soon should it be done? Should both sides be painted or only the top?

Fooling the Gas Man.

From E. K. S., *Brooklyn, N. Y.*—There is food for reflection in the following clipping from a New York paper: "It's a very funny thing," said a housekeeper the other evening, "how the gas companies regulate their bills. A neighbor of mine cooks her breakfast by gas and doesn't light it again until night comes. Her gas bills average $8 or $9 a month. Now, I cook three meals a day by gas and leave a jet burning all night so I can get hot water to dilute condensed milk with for the baby. My gas bills don't go above $5.

I don't know what makes the difference, but I suspect my neighbor bought her gas stove from the gas company, so they know she uses one. They don't know I have one. That must be it."

The ways of gas corporations and their collectors are dark and mysterious. Do the companies pay the latter on commission, allowing them to screw as much out of their innocent and unsuspecting victims as possible, regardless of the meter? It looks as if this was the case in the good town of Brooklyn, at any rate, where the canny housekeeper above quoted does most likely dwell. I live in the City of Churches and have had a similar experience. Some months since I moved, with my family, into a small flat. At the end of the first month the gas collector appeared with a bill for $2.65. This was paid without murmuring. The second month ended and brought a score of $3 75. A gentle protest accompanied payment this time. But when the third monthly account was found to foot up to over $5—with no increase in the expenditure of gas, but rather the reverse, for I had been careful to economize it in every way—the worm turned. Vigorous objections to payment were made; something was said about "robbery" and "fraud," and the man was told to take the something meter out of the house, as only oil would be burned forever after. Result: Apologies; "some mistake;" bill taken back for correction, and returned at—$2! Never since has it been over that sum, but fluctuates between $1.50 and $2. Yet no economy is used. Gas is burned *ad libitum*, and a gas stove, for night use, has become one of the features of my establishment, not obtained from or with the knowledge of the gas company, of course! Perhaps this little story may interest some of *The Metal Worker* readers who may be groaning every month under the burden of a weighty gas bill As to the strict morality of the transaction, I shall say nothing nor make any defense. When one has to deal with robbers one must, in self defense, use their weapons. But what I should like to know is: What is the use of a gas meter, anyhow?

Heat Proof Black Wanted.

From A. J. T., *Boston, Mass.*—Will you please inform me in *The Metal Worker* what to use to coat the front end of a locomotive boiler that will keep black and glossy and will not wash off?

Note.—We submit this question to our readers, as no doubt some of them can answer from experience. A good quality of asphaltum varnish will probably answer the purpose if the heat is not too great. If the requirements are made known to some manufacturer of such goods it is probable that something that will meet them can be produced.

Fails to Bake on Bottom.

From J. F. T., *Meadville, Pa.*—I notice in the Letter Box of January 20 that "W. S.," Guelph, Ont., complains that he is sometimes annoyed by having stoves that would not bake at the bottom of the oven. Since natural gas has come into use for fuel it is not an uncommon thing at all here to have customers make this complaint, but we have no difficulty in remedying the trouble. Nine times out of ten the trouble comes from closing the check damper in front of the stove and shutting off the air supply. It is almost invariably one of the following reasons that causes the trouble: Either closing of the air draft supply, or soot, sand or mortar have stopped the draft of the pipe at flue hole in the chimney. I have, however, in my experience had some trouble with stoves not baking well on the bottom when other than gas was used for fuel—that is, coal and wood. The cause of it has frequently been that cold air was drawn into the stove and into the flues through the joint where the bottom plate joined the side of the stove; the joint not having been properly puttied, or having opened from some cause, allowed the admission of cold air into the flue or between the bottom of stove and oven plate. If the oven damper closes tight, thereby causing the hot air and combustion to pass down and between the bottom of stove and oven plate, the stove will bake—it can't help it. Perhaps "W. S." has queer people to deal with in Guelph, such as are found in many other places. I have sold stoves to people and had them come back and complain and find fault about the stoves not baking, when I knew positively that they were lying, for I have gone and tried the stove and baked potatoes or something to convince them. They were of the same opinion still, and did not want to be convinced. In other words, after getting the stove home, for some reason (they probably knew what it was) they wanted to change the stove and could find no other reasonable excuse for wanting to change, so blamed the poor, mute stove for not behaving nicely and doing its work properly.

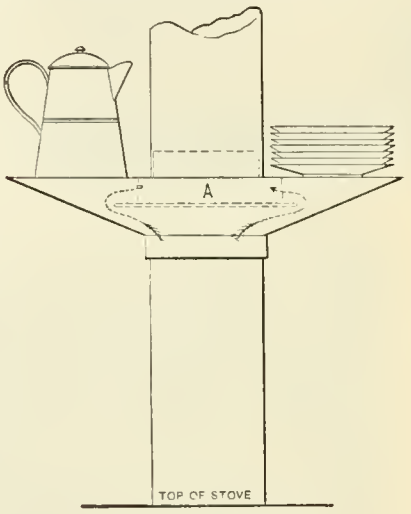
From A. P., *Port Jervis, N. Y.*—In answer to "W. S.'s" question in *The Metal Worker* of January 20, about stoves not baking on the bottom. This trouble occurs almost entirely in new stoves (except where flue strips are not in place, &c.). After a stove has been used the top oven plate becomes covered with soot and ashes, which retards the heat, and the bottom of the stove becomes covered with soot, which retains the heat against the bottom oven plate. This generally makes the range bake evenly. To remedy the baking at once either put some plaster of paris on the top oven plate or put a piece of sheet iron in the oven at the top a little wider than the oven and spring it in to hold it in place. This forms an air space, which has the same effect as the plaster of paris. This remedy I have tried and found satisfactory.

Better Marked Stove Repairs.

From J. F. T., *Meadville, Pa.*—I want to relieve my mind of a little matter which I have been thinking of doing for some time, in reference to getting stove repairs for my customers. I find a great deal of trouble and annoyance from the fact that scarcely one of the manufacturers from whom I order repairs ever marks a repair piece so that one could tell to what stove it belonged. Now, what I would think would be the proper thing for the stove manufacturers to do would be to write plainly on a tag secured to the repairs, or on a printed label pasted on each piece, the name and number of the stove to which the piece belongs. I have not any doubt but that every retail dealer has experienced more or less trouble in this matter as well as myself. Many times people do not call for castings they have ordered, and a dealer forgets to what stove a fire back or grate belongs, and the result is these accumulate, when if they were marked he could make use of them; and sometimes others might want just that piece and he orders it when he has it in stock, but does not know it.

Improved Stove Pipe Shelf.

From EPICURE.—I send *The Metal Worker* a sketch of a very effective stove pipe shelf, which also has the advantage of being made of sheet iron, so that any tinner can make it. The ordinary open work cast iron pipe shelf depends upon what heated air arises from the stove, and in some cases this is not enough to keep articles of food in good condition



Improved Stove Pipe Shelf.

for the table any length of time. I made one of these for my own use, and made it about 16 inches square, with a 6 inch pipe in the center, and think that is about the right size. The sketch with the description clearly shows the construction. The lower section can be cut on any desirable flare, and the upper section or shelf is hemmed over the edge of the lower section to unite them. Pipe collars, to allow the stove pipe to enter inside at the bottom and go over the collar on the upper side, are provided the same as for any drum stove. It can be made round, but that will not afford as much room for the dishes as at the corners on a square shelf. A deflection, as shown at A, may be put in to force the heat to the edges, but it will be found to surpass any ordinary pipe shelf without this from the natural conduction of heat by the metal. At the time that I made the one mentioned I was not in business, and now I am in a city store and cannot give any particulars about the sale, but think a number could be sold by any country shop who kept them in sight of customers or on a stove where they would show the heating qualities. Perhaps I am generous not to patent it, but what is my loss may be some of your readers' gain.

Flat Seam Roofing Questions.

From G. R J., *Savannah, Ga.*—Seeing the queries of "S. P. K.," in *The Metal Worker* of January 27, on standing seam roofs, I should like to have about the same information on flat seam roofing. Of course in putting the tin

together in rolls the time would be the same and the solder would be the same in flat as for standing seam, but is it good practice to put flat seam roofs on in strips? Should it always be put on one sheet at a time? How many nails should be used to the sheet? How long does it take to prepare a box of tin for roofing when all four sides are edged and all four corners are notched? How much time is required to lay a square, or rather what is an average day's work in flat seam roofing, when it is put on a sheet at a time, and also when it is put on in strips. How much solder to the box is required in soldering a flat seam roof both ways? These questions have long since been settled in the minds of a good many of the roofers, but I am satisfied that an interchange of opinion and practice will be a revelation to some who carry on the business, and if a better understanding and a true knowledge of the cost is in the possession of some who are now bad competitors, better prices can be got and better work be done. I hope some of my fellow roofers will take the trouble to answer my questions and I shall be glad to give my experience on the subject later on.

White Japan Wanted.

From H. S., *Gardner, Mass.*—Will *The Metal Worker* tell me how to get a white paint or paint of light color, to be used on a pan that sometimes holds water and sometimes kerosene, though the kerosene would always be in very small quantities. The pan is occasionally subjected to a little heat. I am at present using white lead, varnish and turpentine, which does not give satisfaction.

Note.—Any manufacturer of japans can furnish a white japan which is applied in one or more coats and dried for several hours in an oven at a temperature somewhat above 200°, and which will probably answer the purpose.

Dead Black Finish.

From J. H. W., *Brooklyn, N. Y.*—In answer to the inquiry of "E.E. H.," in *The Metal Worker*, February 3, for a dead black finish, he will find it in Enameloid No. 4, made by the Celluloid Zapon Company, 41 Barclay street, New York.

The New York Trade School had visitors last Monday from Chicago and Boston. Chas. H. Webb came in the interest of the Armour Institute of Chicago, to gather information for the addition of the painters' trade to those taught. Supt. S. F. Hubbard and Plumbing Instructor W. H. Haskell of the North End Union of Boston gathered information as to the methods and appliances used in teaching the plumbing trade.

A German technical paper publishes the following recipe for the preparation of a cleaning soap for bronze, brass and silver ware: Fifty parts finely cut cocoa soap is by heating dissolved in a sufficient quantity of water to form a thick paste. Again 5 parts crocus are stirred up with a little water and 1½ parts carbonate of ammonium are mixed with it and stirred into the soap paste, after cooling. The obtained paste is preserved in a stone jar, well tied up with bladder or parchment paper.

Coke in the Foundry.

From a paper on "Coke" read by C. K. Pittman of Chicago at the last meeting of the Western Foundrymen's Association, we reprint the following extract:

The heart of the foundry may be said to be in the cupola. Most of the troubles that come originate there. There is no part of foundry work that demands such close and intelligent care. If the cupola is not in proper condition or not adapted for the work, if the iron is not of proper grade, if the coke is too light or too impure, if the flux is unsuitable, if the blast is too intense or too weak, if the supply of air is too great or too small, the effect will be seen in the finished casting. The overlooking of one small point may spoil the whole work.

To lay down a rule or set of rules for the use of coke in a cupola is not possible. The efficiency of the furnace depends upon the proper adjustment of the parts and the accurate working of all to one end. It is necessary to be personally acquainted with the cupola and the blast furnace. A man who was practically and theoretically familiar with a certain blast furnace once said, when many miles distant from it: "If you will tell me the condition of the atmosphere, the strength and direction of the wind at the furnace to-day, I will tell you what grade of iron is being produced." This claim was in a large measure justified by test. The chemical reactions that take place in the cupola are imperfectly understood. We know enough, however, to appreciate the importance of a full knowledge of the constituents of iron and coke, and it may be added there should be a similar knowledge of the flux that is used. Only by such knowledge can the proper kinds and proper proportions be known. The use of an improper flux and even an excess of a suitable one may produce the same effect that excess of sulphur in coke or iron does. To what extent iron will absorb sulphur from the fuel is not known, but when the coke contains 1.5 per cent. and probably 1.25 per cent., the iron will be deteriorated. It is probable that a better understanding of the reactions of iron, coke and flux will make it possible to use without injury a coke higher in sulphur than is now thought possible. Some recent experiments have been made in this direction, but nothing definite has been reached. Apparent progress has been made, however, in methods for the elimination of sulphur from the molten iron, which may have a bearing upon our problem. Another factor in cupola work that most closely affects coke is the blast. It has been clearly demonstrated that the use of hot blast saves fuel, but the working of most foundry furnaces is so intermittent that its use is hardly feasible. It has seemed that too many foundrymen fail to appreciate the real necessity of the proper adjustment of the air supply that enables the coke to do its work. The pressure of the blast should be sufficient and the amount neither too great nor too small. There is a waste of both coke and iron in either case. If the pressure and amount of air are not enough the melting will be retarded, the fuel will be consumed, but will act too slowly, the metal is deteriorated, runs thick and the castings are inferior. If the blast is too strong the coke is consumed too rapidly, and a portion blown out unconsumed. The intensity of the heat beyond what is needed hardens the iron, is apt to induce chemical action between iron and the impurities of flux and coke and cause the thin liquid slags to attack the lining. Thus the full value of the coke is utilized only with the proper intensity amount and uniformity of blast. The blast moreover must be regulated by the character of the iron, of the coke and the flux. If the coke used is hard and firm the blast should be stronger than if a lighter and more porous coke be used. Many a good coke has failed because the blast was not properly regulated.

It is an error to suppose that sulphur can be burned out by intensity of heat. The analysis of gases escaping from blast furnace chimneys shows no sulphurous vapors, and I think none containing phosphorus. Upon the same principle, in burning coke about one-half of the sulphur of the coal is driven off if the heat is regular and not too intense. If it be too intense the sulphur seems to have chemical affinities developed that cause it to enter into combinations upon which the heat has no effect.

It will naturally result from what has been said that from inattention to details there must be a large waste of coke in cupola work. The loss through breakage in transit and careless handling is small compared with that due to faulty methods. In England the average consumption of coke in cupola work is 280 pounds with a minimum of 175 pounds per ton of iron melted. In this country the best practice puts the minimum between 150 pounds and 225 pounds, though this is perhaps too small. What the average is I cannot say. In what has been said in a general and rather desultory way, the object has been not to criticise, but to call attention to those more obvious points in foundry practice that may be improved, as they appear to a layman. The use of coke is so intimately bound up with all other materials that enter the cupola, and one so depends upon the others that no rule of action can be formulated for one that does not apply to others. Considering coke alone we can say that so far as we now know it is the best fuel for the melting of iron in the cupola, because it is, as a rule, more pure and uniform, and, when properly used, will give the maximum of efficiency. When we ask what the best coke is we can hardly answer in a word. We must take into account the kind of work to be done, the iron to be used, the flux that is best adapted and the conditions of the blast. We must know in a measure what our iron contains, what are the constituents of flux and coke. We should know as much as we can of the chemical affinities and relations of these constituents. Then we can say with some degree of accuracy whether Connellsville or Pocahontas is best, whether New River or West Virginia will be most efficient and economical.

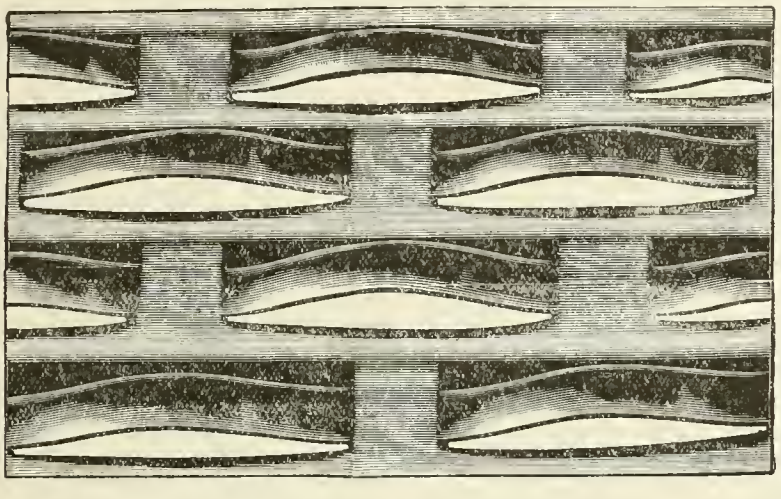
Sir Douglas Galton, the eminent British scientist, in a paper on "Ventilation, Warmth and Light," recently read by him at the Parkes Museum of Hygiene, London, referred to the ventilation of the English public schools as a disgrace. While children were compelled to attend the schools, he said, the lack of proper ventilation in the school rooms made them dangerous to their health.

The boiler maker with oratorical proclivities, says the Buffalo *Courier*, should have little trouble in riveting the attention of his hearers.

ROOFING AND CORNICE.

Sheet Metal Lathing and Fire Proof Partition.

Turnbull & Cullerton, 195 La Salle street, Chicago, are manufacturing and introducing to the trade a new form of sheet metal lathing which was patented by George A. Turnbull, January 2, 1894, and assigned to Turnbull & Cullerton. This lathing is constructed of soft steel, and corrugated in the direction of the length of the plate, which is longitudinally slitted at suitable intervals between adjacent corrugations, the metal being turned out at the margins of the slits. Thus free lips are produced which permit the passage of the mortar, and guide and control it as it passes through the perforations so as to prevent waste and to cause the mortar passing through adjoining slits to unite upon the back of the interposed corrugated strip to form a key. The construction is such that the key is not subjected to the action of any sharp edge or part of the metal whereby the key would be cut or weakened. In Fig. 1 is presented a horizontal section showing curve of bridge, hight, retentive lips and openings. In Fig. 2 is presented an edge section, showing comparative hight of bridge and mortar crevice or opening. This lathing is made in sheets of ½ square yard each, and can be cut to fit any opening, angle or curve, as may be desired. As this lathing has large key openings and a small percentage of dead surface, the plasterer is enabled to cover a large surface with a great saving of material, as a heavy first coat can be applied, and then finished with as good results as with three-coat work on wooden lath. While this lathing can be applied to wooden studding in the usual manner, when a fire proof partition is required it is constructued as shown in Fig. 3. The Monarch fire proof partition (on which a patent has been applied for) is built on steel grooves of special design, and is securely held in position by adjustable wrought iron foot and head plates made for the purpose. A foot holder is shown in Fig. 4. A false jamb is then secured to this frame work by means of iron staples, to which the door jambs may be easily attached. The steel stanchions having been placed in position they are covered on both sides with the sheet metal lath, being secured with barbs cut on the flanges of the upright grooves, which are driven through the lath and clinched down on the outside, thus holding the sheets straight and solid. As these partitions are constructed with 1½-inch channel steel, when finished they are only 2½ inches thick. In addition to the lightness of this partition it is pointed out that as it is hollow it will not conduct sound, besides affording ample space to convey speaking tubes, electric wires, &c.



Sheet Metal Lathing and Fire Proof Partition.—Fig. 1.—The Turnbull-Cullerton Steel Lath.

Fig. 2.—Section through Lath.

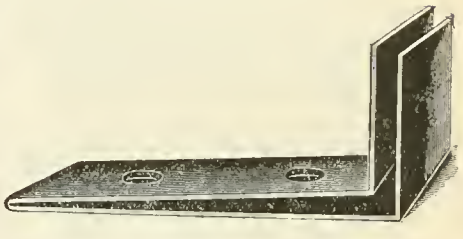


Fig. 4.—Foot Holder for Partition Uprights.

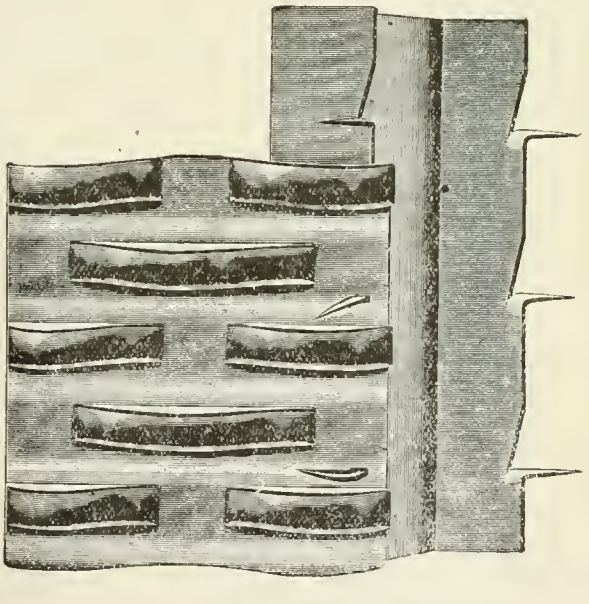


Fig. 3.—Fire Proof Steel Lath Partition.

The United States Consular Agent at Londonderry, Ireland, in a recent report to the State Department, makes interesting reference to the appreciation of Pennsylvania roofing slates in his consular district. One of the largest building contractors in Londonderry, who had received a cargo of their slates, had informed the agent that for uniformity of dimensions, quality and color (deep sea green) he had found it superior to any other slating imported. It was entirely free from pyrites, possessed an extraordinary toughness, and was found to be the most desirable slate for every description of roofing in exposed situations. For these reasons, the consular agent believes, the sale of American roofing slates could be pushed, not only in Ireland, but throughout Europe.

The Development of the Iron and Steel Roofing Industry.

Not long since we drew attention to the remarkable increase in tonnage of iron and steel roofing produced in the United States at the present time compared with 12 years ago, at which time there were only a few iron roofing concerns in existence. Now they are distributed all over the country. In the early days of the industry each manufacturer had some special design of roofing upon which his attention was concentrated, and these specialties are still before the trade, but so numerous are the designs patented and so good are the claims of each, generally speaking, that the manufacturer himself is often puzzled as to which special kind of roofing he shall push the sale of in preference to others. When each maker had only one or two lines to offer a four page circular printed in two colors was considered an enterprising step, but now the smallest concern will not hesitate very long about publishing 40 to 80 page catalogues, which are usually fine specimens of typographical art. When salesmen first made the acquaintance of consumers of roofing they had little else to offer besides iron roofing and red oxide paint. To-day roofing salesmen offer a full line of metal roofing and specialties. In their catalogues will be found various styles of rolled roofing, iron and steel, prepared ready to lay, tools loaned for the purpose. A few specialties in standing seam roofing, V-crimped, corrugated, beaded and other kinds. Then will follow supplies, such as paints, nails, felt lining, ridge roll, ridge cap, &c. In ornamental designs there are painted sheets, pressed to imitate brick or weather board, also handsome designs for ceilings and galvanized sheets pressed to imitate rock face, steel shingles, plain and ornamental, and a variety of metal roofing in other designs. Other adjuncts to the roofing manufacturer's business are galvanized conductor pipe, eave trough, miters, cornices, finials, and, in fact, anything and everything in the shape of sheet metal goods required for finishing a building. Many of them have added galvanized and black sheets, flat, to their catalogues, also tin and terne plates.

As the early manufacturer has developed his lines of manufacture and general business methods so has he developed his machinery and arrangements for producing goods at the lowest possible cost. He loses no time at any stage. The best machinery obtainable is purchased and a large tonnage is produced for small labor expenditure. He advertises freely and well, and his sales men are so fully prepared that a good man has every opportunity to sell something or other in each town he visits.

There is probably no other business in which the consumer comes into such direct contact with the manufacturer. The proportion of iron and steel roofing handled by jobbers is very small. They handle very little of the $6,000,000 passed annually between consumers of iron and steel roofing and manufacturers.

The British Roofing Trade.—Corrugated iron was the first form in which iron sheets were applied to buildings for roofing purposes in large quantities—*i. e.*, it was the first staple commodity for the purpose listed in trade papers of Great Britain and its colonies. In its flat form sheet iron has been used for roofing purposes ever since its introduction. The trade of India, Australia, New Zealand and Canada has furnished orders of great value to the English Ironmasters for many years past and they continue to enjoy this trade, but their products have in the course of time assumed a different shape. At one time all orders from British India and the East were standard specifications. Merchants were unable to figure ahead in regard to special specifications for various purposes and nine-tenths of the orders were made up in sizes easy to handle and transport either by ocean, railroad or camel back. A very familiar size was 4 x 2 feet. This size served any and all purposes of British India, Burmah, Egypt, Northern and Southern Africa and any other part of the world under submission to England, where the English language was not spoken generally or civilization was kept down to the standard desired by British traders.

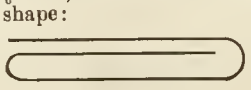
The uses to which this material was put do not come strictly within the business of iron roofing, but many of the gauges shipped were used for that purpose. An ordinary specification for export sent to an English rolling mill would read about as follows:

	Per bundle.	Approximate thickness.
4 x 2 feet by 112 pounds, 1 sheet	=	3-8 inch.
4 x 2 feet by 112 pounds, 2 sheets	=	3-16 inch.
4 x 2 feet by 112 pounds, 3 sheets	=	13 gauge.
4 x 2 feet by 112 pounds, 4 sheets	=	15 gauge.

and so on up to 14 sheets per bundle, the last named representing No. 26 gauge, which was the lightest gauge ordered.

Although transgressing somewhat beyond the purpose of this article, it is a means to an end—viz., to refer to foreign development in the iron and steel roofing industry parallel with American development. British colonies and dependencies have always accepted what traders offered no matter whether the sizes suited their requirements or not. American consumers are nearer to the source of supply and make demands for the class of material which conforms to their ideas of what should be furnished, hence the difference in development of the industry in England and America. The ritual of the British trader is that if a certain thing has pleased a buyer once it must please always, and he will not change his notion until he realizes that a trader from some other nation is getting the best of him. Britishers have a strong hold upon foreign trade for all classes of iron and steel products, and will not change their specifications except under great pressure. In Spanish, Spanish-American and Brazilian trade this is amply illustrated. To these countries the sizes of sheet iron are always made under the metric system: Two meters long by 1 meter wide is the regular size (6 feet 6¾ inches by 3 feet 3⅜ inches) and sheets of this size are cut up for any purpose for which they may be needed. The lightest gauge ordered is about 28 gauge, eight sheets to the bundle, 112 pounds.

The two kinds of specifications referred to are common orders for export trade. The lighter sheets are used for roofing purposes and the heavier for general purposes. In the first specification the bundles of light gauges are often doubled up so as to be transported on the backs of camels, and the heavy plate, such as 4 x 2 feet by ⅜ and $\frac{3}{16}$ inch, are bent hot into the following shape:



Ropes are passed through the folds to make secure on camels' backs, and the material is thus carried across the desert. The sheets which are used for roofing purposes are usually painted white after being applied.

Flat sheets for roofing purposes form but a small part of England's trade in this line. Corrugated sheets are staple in the markets of British exporters. Orders for black or painted are seldom heard of. Nearly all corrugated sheets shipped from Great Britain are galvanized. The trade is enormous. Everything is corrugated. Standing seam roofing is almost unknown. Steel or iron shingles (slates, as they are called in England) are occasionally heard about, but the bulk of the trade is galvanized sheets and almost the entire product is sent abroad, Australia, South America and India furnishing the best customers. For shipment the sheets are placed in felt lined crates, each containing about 1120 pounds (½ gross ton). The material is generally iron, not steel. Most of the galvanized sheets made in Great Britain are from muck bar piles with a top and bottom of wrought iron turnings or scrap worked on cinder bottom. The bars are rolled free from scale and the ame care is taken in rolling sheets. The English claim, and no doubt justly, that sheets made in this manner are better for galvanizing purposes than steel. It is a common error among Americans to judge galvanized sheets by the size of the spangle. If the spangles are large it is a sure indication of a smooth surface of steel or iron, as the case may be, but a sheet having smaller spangles may give longer service for the reason that the coating adheres more firmly. For some purposes the steel sheet with its brilliant spangles is preferable, but for outdoor work the iron sheet with its smaller spangles of greater adhesive quality is to be desired, always provided that the iron sheet is tough and pliable.

English Corrugating Machinery.—English manufacturers of corrugated sheets do not use rolls for the purpose. Presses are used exclusively. Fig. 1 illustrates a common design of corrugating press used in England and Scotland. In the matter of strength, judged from a weight of metal standpoint, it would outclass any two American machines in existence. Britishers never spare metal in a machine of any description. No matter for what purpose it is intended, its strength is judged first by its weight, whether properly distributed or not. This is a blunt assertion, but, nevertheless, true. Witness lathes, machinery, agricultural implements, or any other class of heavy tools exhibited by British makers at the World's Fair, or compare vehicles for pleasure or business. There is nearly always twice as much iron or wood used as in American manufactures used for similar purposes. The Britisher is always "afraid it will break." If the corrugating machine illustrated in Fig. 1 breaks with anything lighter than No. 12 gauge worked upon it the cause will be culpable negligence in its adjustment. The plunger A is solid cast iron; to this the upper die is attached. This die makes two corrugations of ordinary size. The lower die is fixed to the bed B, which is also made of cast iron. Contrary to the rule adopted in American machines, the driving shaft is at the bottom of the machine (note shaft C) and the motive power is placed at the side, bedded on the ground, instead of being attached to the machine above the heads and out of the way of operators. When changing from one thickness of sheet to

another the difference is adjusted by means of adjustable screws, D. When corrugating sheets as light as No. 28 gauge six are placed in the machine at one time. It must here be stated to the credit of Britishers that their standard gauge is nearer to No. 24 than No. 28, strictly products of American ingenuity with the exception of corrugated sheets. No ideas have been borrowed from any other country and no other country has developed the industry to such an extent. In fact, it is doubtful whether any other industry known to the world and still maintains its prestige as the largest producing center. Corrugated iron was made in Pittsburgh and the East 25 years ago, but only in small quantities. The importance of the iron and steel roofing business in America dates from that time. In 1868 the firm

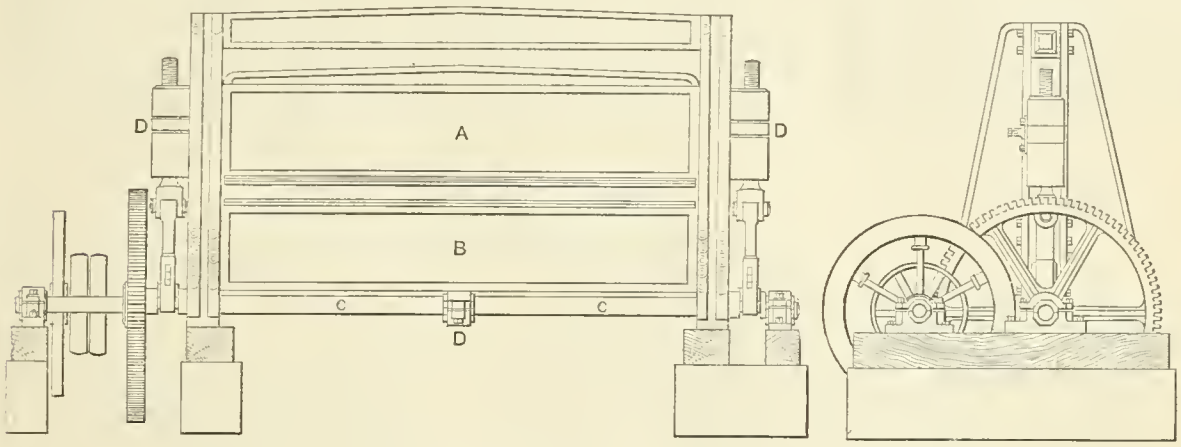


Fig. 1.—English Corrugating Press.—Length of Die, 10 Feet 3 Inches.

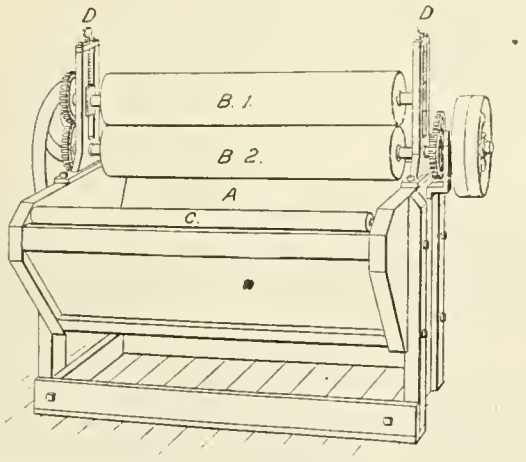


Fig. 2.—The Modern Painter.

of Caldwell & Co. was established in Cincinnati. They made rolled edge roofing by hand power. The design was known as "Outcalt" pattern and the machine used passed into the possession of the Cincinnati Corrugating Company after the death of Mr. Caldwell in 1883. The machine has since been destroyed, but the last named company continue to manufacture that style of roofing. Mr. Caldwell's death caused a dissolution of the firm, and the honor of being the oldest roofing concern now belongs to the Porter Iron Roofing & Corrugating Company. Immediately after Caldwell & Co. started in business W. S. Belt commenced operations. In 1876 Mr. Belt's business was sold to W. H. Porter, the present secretary of the Porter Iron Roofing & Corrugating Company. The Porters consequently have the oldest roofing

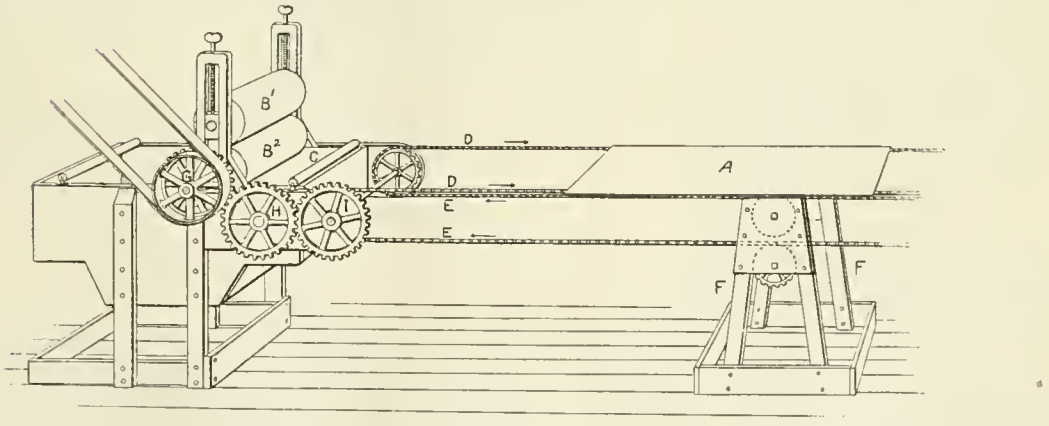


Fig. 3.—Sheet Carrier Attached to Painter.

THE DEVELOPMENT OF THE IRON AND STEEL ROOFING INDUSTRY.

and sheets as light as the latter gauge are the exception rather than the rule. The standard adopted recently by the National Iron Roofing Association is No. 28 painted sheets. The bulk of English orders are No. 26 galvanized.

The American Roofing Trade.—The variety of forms into which iron and steel roofing is made in this country are

was developed in such a degree in so short a space of time. The active history of the industry does not date back more than 15 years, although it struggled against prejudice 10 years prior to that time.

From the best information obtainable it is learned that Cincinnati, Ohio, was the first important seat of the industry

business of Cincinnati and are the original makers of V-crimped roofing in the United States. In 1873 Scott & Co. started an iron roofing manufactory in Cincinnati and the concern are still in existence. Other concerns still doing business at their old stand are: W. G. Hyndman & Co., established 1877, and the Globe Iron Roofing & Corrugating

Company, who commenced business about 1880. Several other concerns were formed between 1875 and 1880, but they are now out of existence. About 1878 the New York Iron Roofing Company moved to Cincinnati from Ironton, Ohio, and were afterward succeeded by the Sagendorph Company, now known as the American Roofing Company.

Among the most successful of Cincinnati roofing companies were the Cincinnati Corrugating Company, established about 1879. They were the first company to make a specialty of corrugated iron, and they did such an extensive business that they were compelled to move to more roomy quarters a few years ago. They selected Piqua, Ohio, for a site, and their entire business was moved to that point, where operations are continued in connection with the Piqua Rolling Mill Company, from whom their supplies of iron and steel sheets are drawn. The removal of this company withdrew a large tonnage from Cincinnati, but it is still the largest producing center. Other important seats of the industry are St. Louis, Chicago, Cleveland, Ohio; Niles, Ohio; Wheeling, W. Va., and Canton, Ohio. The roofing works of M. H. Chittenden & Son, Minneapolis, are the nearest to the Pacific Coast and Northwest.

The number of manufacturers engaged in the iron and steel roofing business has increased from 20 to 60 in 12 years, and the quantity of sheets used for the purpose from 20,000 to 100,000 tons.

American Machinery. — American manufacturers have made wonderful changes and improvements in sheet metal working machinery, not only in the roofing business, but all other branches. The number of manufacturers of iron and steel roofing has shown an increase during the past few years fully equal to the growth in the demand for such material, if not greater, and the older manufacturers, desiring to maintain their prestige, have adopted economical methods of production in order to distance new competitors. This competition, together with lower values of iron and steel sheets, has made iron and steel roofing cheaper year by year, and competition is no longer with the slater or shingle splitter. It is confined to the iron roofers themselves. The increased number of manufacturers engaged in the business, improved machinery and lower prices of iron and steel sheets have caused brisk competition, that has brought the cost of iron or steel roofing far below that of shingles or slate. The first important step taken by roofers was in the matter of painting sheets. At first all sheets were laid across trestles and painted by hand. Plenty of paint was used, but it was not evenly distributed. It was heavy and light, in patches, it dried slowly and was not satisfactory. Boys were usually engaged in the work and they generally managed to get as much paint upon their clothing and on the floor of the painting shop as they did upon the sheets.

when the old has worn thin, or the raising distance of the upper roll can be adjusted to sheets of varied thickness. To facilitate the operation rollers C are placed on either side of the paint tub. This first step toward improvement was important, but roofers still found it expensive to carry sheets from the painter to the drying racks. So much room is required for drying that buildings for the purpose vary from 100 to 600 feet in length. If the painter is located at the end of the building where black sheets and painting material are received, as it should be, it is expensive to carry

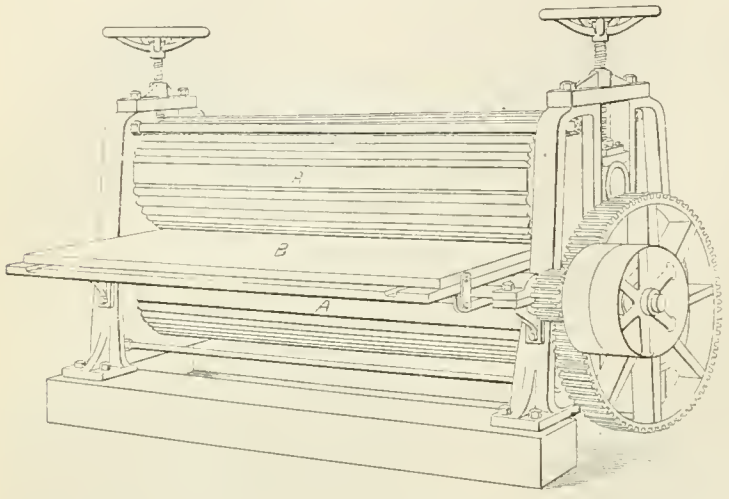


Fig. 4.—Corrugating Rolls.

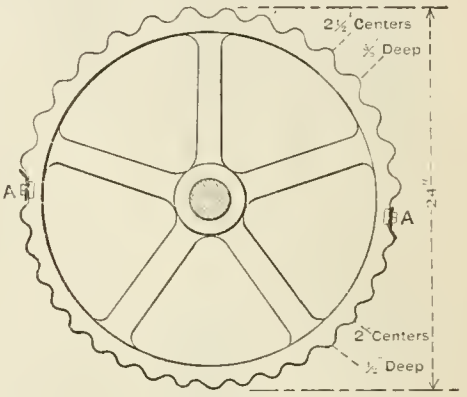


Fig. 5.—End View of Corrugating Roll, Showing Guides.

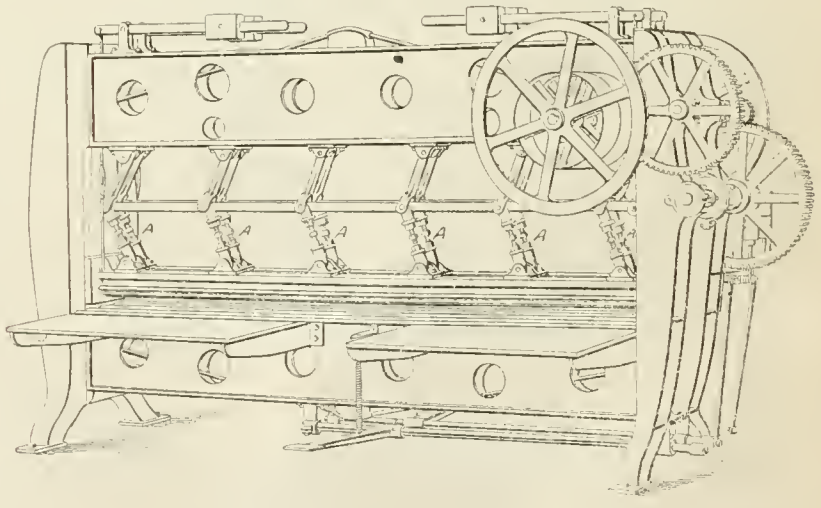


Fig. 6.—Corrugating and Forming Press.

THE DEVELOPMENT OF THE IRON AND STEEL ROOFING INDUSTRY.

The Modern Painter.—The modern painter here illustrated was designed by W. G. Hyndman, the veteran iron roofer of Cincinnati, Ohio. The method of operating is simple. Tub A, Fig. 2, is filled with paint. In feeding sheets to the painter, the end of the sheet is dexterously dipped by the operator into the paint so as to catch up the smallest quantity possible, and is then passed through rolls B1 and B2. These rolls are covered with canton flannel, which absorbs the paint and distributes a very even coat over the sheet. The lower roll B2 is fixed in a stationary journal, but the upper roll B1 is adjustable, turning in a movable journal box. By raising screws D room is allowed for a new covering of flannel sheets the full length of the building. To decrease this expense the chain carrier illustrated in Fig. 3 was devised. It is very simple in construction. A few supports are required, placed about 12 feet apart, a few hundred feet of link belt and some sprocket wheels. The motive power is derived from a cog wheel placed on shaft of roll B2. This cog wheel or pinion is placed inside pulley G, and operates cog wheel H, which in turn causes pinion I to rotate in the desired direction. This pinion is fixed upon an extension on the paint tub, the shaft is carried through to an extension on the opposite side of tub and two sprocket wheels for driving the link belt are placed on the same shaft on the inner side. Sup-

ports F carrry two shafts, each having two sprocket wheels fixed on the inner sides. The link belt travels from the painter over the top of the upper sprocket wheels and returns over the top of the lower wheels, as indicated by arrow marks E and D. The sheet of painted iron A has passed through rolls B1 and B2 over the roller C to the link belt, and is thus carried, as shown in illustration, the full length of the carrier, unless removed at an intermediate point to be placed in the drying racks. By this process one man can feed sheets to the painter as fast as six men can remove them from the carrier. The average capacity is 500 sheets per hour. Since the average weight of the sheets used is 12 pounds, the capacity is 60,000 pounds per ten hours. The men employed to carry sheets from the carrier to the drying racks stand on either side about 25 feet apart, so that each gets his sheet in rotation and there is no waiting.

Corrugating Rolls.—When corrugating rolls were first introduced they were made small in diameter and did not corrugate the sheets perfectly. This was due to the spring in the rolls, which were cast hollow. This caused a twist in the sheets, which prevented a perfect fit when placed together. A pair of rolls relegated to the scrap heap a short time ago were only 18 inches in diameter. Rolls now made are more than twice as large. The old style corrugating rolls were only made for one size of corrugation, and separate pairs of rolls were kept in stock for various sizes. Machines are now constructed so that several different sizes can be made by changing the shell of the rolls without taking the barrel from its position. The corrugating rolls illustrated in Fig 4 are known as double corrugating rolls, one-half of each roll being for one size of corrugation and the other half for another size, the division being at flat part A.

The sheets are fed to wrought iron guides, A A, in the accompanying sketch. These guides are set in the flat part of rolls, and are slotted so that they can be moved forward or backward as required, so as to make the first corrugation either full or half corrugation, as may be desired. This improvement insures accuracy in fit of sheets, as each side corrugation will be exactly alike, provided the sheets are sheared square.

Corrugating Presses.—Fig. 6 illustrates a modern style of corrugating and sheet metal forming press. It is a much lighter machine than the English corrugator illustrated in Fig. 1, but the strength is so evenly distributed to required parts that it is capable of corrugating or forming sheets as heavy as No. 16 gauge. In the English machine the plunger A is solid. When it descends it makes two corrugations, the draw in the sheet being allowed for by making the corrugation on the finishing side deeper than the corrugation on the near side. Each corrugation is finished in the groove on the finishing side. In the American machine the plungers A do not each descend at the same time. The plunger on the back side descends first and the draw in the sheet is taken up before the plunger on the front or feed side descends. The motive power of this press is attached to the cast iron side columns of the machine out of the way of the operators, instead of being on the floor, as shown in the English machine, Fig. 1. The American press can be used for forming a large variety of designs in sheet metal roofing and siding. The improvements referred to in this article do not by any means comprise all that have been made up to date, but are sufficient to illustrate the advanced stage of the industry compared with 15 years ago.

The Export Roofing Trade.—Production has been reduced to minimum cost, and a near approach to perfection attained in the quality of iron and steel roofing material. In its large variety something can be found suitable to any style of building, and the convenient shape in which it is packed makes it possible to ship to any part of the world. Up to the present time the quantity of iron and steel roofing material shipped from America to foreign countries has been very small and cuts no figure in the importance of the industry, but there is no reason why good connections should not be formed in this line of business with Central America, Brazil, the La Plata, and other valuable markets of South America. In Australia there is a wonderful field open. Iron buildings are as common there as frame buildings in America. They are made of galvanized iron usually, and are so constructed that they can be moved readily from one section of country to another. With the wonderful facilities that the United States possesses for wood and sheet metal working, there is a chance to supply Australia with cheap portable buildings constructed of wood and iron which is worth looking into. At present this trade is controlled by English manufacturers.

A NEW SLATE COMPANY has been formed at Stroudsburg, Pa., named the Blue Ridge Slate Company. George H. Rhodes of Stroudsburg is treasurer of the concern, which has leased a large quarry near Wind Gap and will begin operations immediately.

Nativities of the Iron Miners.

Some statistics published by the Ironwood, Mich., *News Tribune*, respecting the nativity of the unemployed in that town and its immediate vicinity, are interesting. There are in the county of Gogebic, in which Ironwood is situated, 5447 persons receiving aid. These persons are receiving charity because of the fact that the iron mines in the county, which formerly furnished employment to the heads of the families, are shut down and the miners are out of work. The Ironwood paper gives the following table of the number of persons, by nationalities, who are dependent upon charity:

	Wakefield.	Ironwood.	Bessemer.	Total.
Poles	43	268	315	626
Fins	168	448	126	742
Italians	60	92	102	254
Germans	..	260	109	369
Bohemians	..	209	74	283
Scandinavians	75	859	77	1,011
Irish	35	701	56	792
Hungarians	..	22	12	34
French	16	210	25	251
English	54	633	151	838
Slavs	..	27	..	27
Americans	5	44	14	63
Syrians	..	14	..	14
Austrians	..	79	12	91
Scotch	..	11	..	11
Hollanders	..	..	10	10
Welsh	8	..	..	8
Totals	486	3,878	1,083	5,447

There are but 63 native Americans in a total of more than 5000 persons who are either miners or of the families of miners.

All the commercial organizations of New York City are forwarding petitions to the Legislature asking for the deepening of the Erie Canal, in order to increase its traffic and correspondingly reduce the cost of freight carriage thereon. It is pointed out that under existing circumstances the rates charged by the canal carriers are more than three times as high as those paid on the great lakes, and are only a trifle less than the rates charged by the railroads paralleling the canal. By increasing the depth of water, in order to admit the navigation of heavier boats, it is claimed that these rates could be profitably lowered, and a large portion of the lake grain traffic which is at present diverted to the St. Lawrence route and ports other than New York would be passed to shipment through this State and city.

Ventilation in Canadian Factories.

In his annual report, recently issued, Dr. C. I. Samson, sanitary inspector for the Province of Quebec, Canada, makes some pointed remarks on the obstacles interposed by the workmen themselves to the introduction of any efficient system of ventilation in the factories and workshops of that section. He says: In this matter it is especially the workman's prejudices that we have to deal with. If we ask the latter what are the sanitary defects of the workshop where he is employed, ten to one he will answer, "there are drafts." This constitutes the great source of disease, in the minds of the workmen. Therefore, no sooner does one attempt to open a ventilator to renew the air in a room than 20 arms are raised to close it. With such notions, the working of any system of ventilation becomes a difficult problem to solve. I have seen suction pipes reaching above the roof which were stuffed with rags. At another place a ventilating apparatus was put up at the suggestion of my predecessor so as to draw off contaminated air from the center of a large room; all the pipes are still set up, but great care has been taken to cut off their communication with outside for fear of drafts. The workman does not sufficiently appreciate the sanitary physician's part in industry, and this hinders the efficiency of the service. That notions of hygiene should be diffused among the people is a problem to be solved.

Of a large number of young men who qualified to enter the Manual Training School at Camden, N. J., but 25 could be admitted, owing to the lack of accommodation for a greater number.

It is announced that the Bell Telephone Company will ask for an increase of their capital stock by $20,000,000 or $30,000,000, in order to meet the enormous growth and development of its business. The present capital of the company is $20,000,000.

The Transvaal gold mines produced 1,478,473 ounces of gold in 1893, as compared with 1,210,862 ounces in 1892 and 728,613 ounces in 1891. It looks as though the gold product for 1894 will reach $35,000,000.

Joseph Richards of Philadelphia has a plan for soldering aluminum which involves the use of phosphorized alloys for the purpose, the function of the phosphorus being to remove the thin film of oxide always present on the surface of aluminum and which renders soldering so very difficult. Good practical results have been attained.

PLUMBING and GAS FITTING.

Domestic Electrical Work.*—X.

By W. A. W.

Electric Gas Lighting.

Fig. 19 shows a reliable and inexpensive arrangement to give an alarm when the circuit for any reason remains closed, or grounded, as it is popularly termed. A soft iron armature is pivoted to one end of the spark coil, as shown at A, and one wire of the alarm circuit

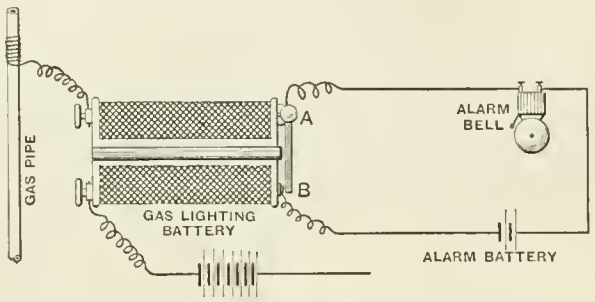


Fig. 19.—*Device to Indicate when a Gas Lighting Circuit is Grounded.*

connected with it; the other wire is connected at B. When for any reason the gas lighting circuit is closed the core of the spark coil attracts the armature and closes the alarm circuit at B. The act of lighting a burner is of such short duration that the bell will scarcely sound, but should the circuit remain closed for a longer period the bell will ring loudly, plainly indicating that something in wrong, so that the battery may be disconnected and saved while the trouble is being remedied.

It is also a very good plan where a large number of burners are used in a house to divide them into small groups and run a separate battery wire to the cellar from each group and there connect them to switches. This will be found a very convenient arrangement and costs but a trifle more. When a ground occurs with a system arranged in this manner it is only necessary to open the switches in succession until the one connected with the grounded group is reached. This should then be left open and the fault traced, while the rest of the lighting system is left undisturbed and in full working order.

The wiring for electric gas lighting is usually done when the pipe fitting is completed. The ends of the wires are wrapped around the nipples which project through the plastering and are left this way until the fixtures are fitted and tested. In the case of side bracket lights, which seldom have a separate shell from the gas pipe, the fixture wire should be run on the under side of the bracket and securely tied at short intervals with linen thread. Two or three coats of shellac varnish should be applied to the fixture and wire. When dry the threads should be removed, leaving the wire firmly glued to the fixture. At the swing joints the wire should be formed into a small spiral coil of sufficient length to permit the fixture to swing either way to its fullest extent without drawing the wire tight. The fixture wire referred to is a No. 22 or 24 triple covered wire made in a variety of colors to match the gas fixture. The connection of this wire with the battery wire should be behind the collar which goes next to wall or ceiling.

In the case of chandeliers, which are incased in fancy shells outside of the gas pipe, we are confronted with the most exacting part of fixture wiring. It is true we can in many instances run the wire from collar to burner entirely between the pipe and shell, and while this is very desirable and necessary to a neat job, it at the same time affords the chief danger of grounding. In running the fixture wire as just described we must encounter the obstructions shown in Fig. 20 at A. These are very dangerous points, for the shell, being very thin, readily cuts the insulation, and the liability of the different parts of the shell being accidently or otherwise turned seriously increases the danger. It will, therefore, be readily seen that the greatest caution should be exercised in wiring fixtures, and enough of the shell should be cut away at the points indicated at A in Fig. 20 to permit the wire to be well covered with rubber tape. In nine cases out of ten where a ground occurs it will be found in the fixture at some such point. But one wire is run down the chandelier pipe from the ceiling, the branches leading to the various burners being spliced on in the hollow globe like shell surrounding the gas pipe where it branches, as shown in Fig. 20 at B.

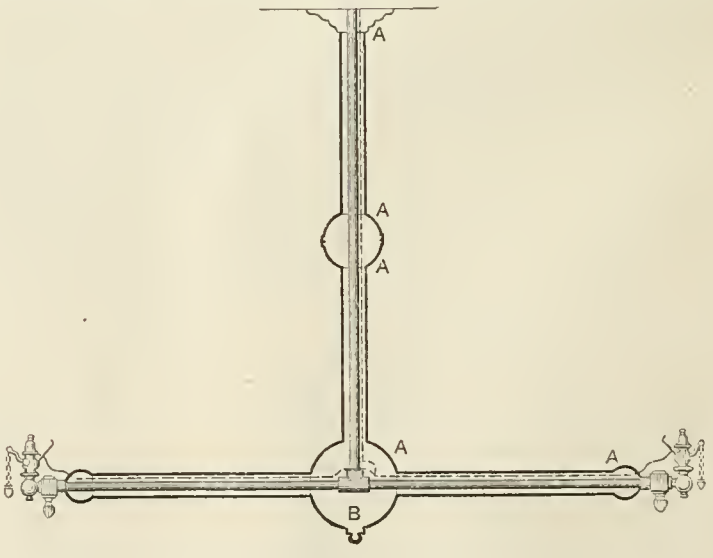


Fig. 20.—*Gas Fixture Wired Inside of Shell.*

Multiple Gas Lighting.

Among the most useful applications of electricity is the instantaneous lighting of large numbers of gas jets in theaters, churches, &c., better known as the multiple system. The central apparatus consists of an induction coil with condenser, key, circuit breaker, battery and circuit switch. The burner consists of a lava standard and tip provided with platinum pointed poles placed in such manner that the spark must jump through the gas. These burners are connected in groups, sometimes as many as 40 or 50 burners being connected in a single group. All the burners of a group are connected in series—that is, the wire runs direct from one pole of one burner to one pole of the next burner, and so on. Plain copper wire, without insulation, is usually used on the fixtures. The gauge is from No. 24 to 27, only one wire being used for each circuit, the gas pipe forming the return the same as explained for pendant and automatic lighting, with this difference—that the wiring should nowhere if possible touch anything but the insulators in its course and should not be brought closer to the gas pipe than 1¼ inches. If, however, it becomes necessary to run close to the pipe the wire should be incased in rubber or glass tubing. If for any reason it should be necessary to run the main wire in contact with wood or stone work a special rubber compound covered wire should be used, but no

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metallic staples must be used to hold it. When we consider that the resistance of a single burner is greater than 100 miles of fine wire would be, we can readily conceive the high electromotive force required and the extreme caution necessary to keep it within bounds. The last burner of each group must be connected with the gas pipe to form the return wire. The gas piping should, of course, be arranged in the same way the lighting circuits are, and each group should have a stop cock located close to the central lighting apparatus. All the local cocks on the burners being left open, when the gas is turned on and the switch set for the group to be lighted a stroke of the key sends the electric spark flashing from burner to burner, igniting the whole group in an instant.

Open circuit batteries may be used with this apparatus. There is, however, a device on the market known as the electric frictional machine, which dispenses with the battery and induction coil. As, however, this class of work is somewhat technical, and the central apparatus must be adapted to the requirements of the individual case, it is much better to furnish the manufacturers of supplies with a full description of the job in hand and get apparatus exactly suited to the case, as well as full instructions for its installation.

[THE END]

Ohio Master Plumbers.

The Master Plumber' Association of Toledo, Ohio, have perfected arrangements for the State meeting, which will be held in Memorial Hall, Toledo, February 13–14. The committees on convention work are: Hall Committee—Perry W. Waite, Theodore L. Meissner and Thomas Manion. Entertainment Committee—Robert Raitz, James W. Gould and Wm. G. Wacker. Finance Committee—Frank J. Kern, George J. Jackson and James Walsh.

Following is the list of present officers of the State Association: President, T. L. Poplowsky, Cleveland; vice-president, Robert Raitz, Toledo; corresponding secretary, C. C. Dewstowe, Cleveland; financial secretary, L. E. Huddleson, Columbus; treasurer, Wm. Hally, Columbus. John A. Waite of Toledo, D. N. Kelly of Columbus and H. M. Stowe of Marion, with the above mentioned officers, compose the State Executive Committee.

Connecticut Master Plumbers.

Thursday, February 15, the fourth annual convention of the Connecticut Association of Master Plumbers will be held at Putnam Phalanx Armory, Hartford. Active preparations for the meeting are now being made by President S. E Dibble of New Haven and his associates, and the banquet and local arrangements are in the hands of a committee.

Besides the regular business to come before the convention, essays on interesting subjects are promised by Robert Morgan of New Haven, Zalmon Goodsell of Bridgeport, Edward Mahl of Hartford, A. Troland of Norwich, J. G. Shearlock of New Haven and others.

The present officers of the association are as follows: President, S. E. Dibble of New Haven; first vice-president, James Ahern of Hartford; second vice-president, J. B. Weiant of New Britain; recording and corresponding secretary, A. J. Clerkin of New Haven; financial secretary, R. H. Stothart of Middletown; treasurer, C. S. Eames of Bridgeport. These, with ex-President L. H. Mills of Bridgeport, constitute the Executive Committee.

Chicago Plumbers' Reception.

The Chicago Master Plumbers' Association held a reception and entertainment in the Auditorium in that city on the evening of the 5th inst. The attendance was very large, comprising not only the members of the association and their ladies but numerous representatives of the plumbers' supply houses and visiting plumbers from neighboring cities. Every care was taken to contribute to the convenience and enjoyment of the participants. In fact, for that evening, the plumbers seemed to own the hotel, having secured a large number of rooms for the use of ladies, others for gentlemen's wraps, and some for smoking and quiet conversation, while the main exercises were conducted in the famous banquet hall of the hotel, magnificently endowed by the richness of its architecture and superb effects in electric lighting for such a brilliant gathering.

The programme of the evening was a *melange* of an exceedingly attractive character, adapted to suit the varied tastes of the assemblage. An able address of welcome was delivered by Paul Redieske, president of the association, after which the retiring president, T. P. Culloton, was called forward to receive a handsome gold badge presented to him as a token of the esteem with which he was regarded by the members of the association. Albert E. Hyde, salesman for James E. Clow & Son of Chicago, then most effectively delivered a recitation entitled "The Darky's Prayer." Next came a grand march and quadrille, with which dancing was inaugurated. A feature of this portion of the programme was the presentation to each lady of a beautiful souvenir of the occasion, consisting of a leaflet of suitable poetic quotations, bound in a rich cover of heavy boards, decorated with forget-me-nots. Dr. A. R. Reynolds, Chicago Commissioner of Health, then delivered an address eulogistic of Chicago and Chicago plumbers. From that time until long after midnight dancing was interspersed with recitations, songs and instrumental music of a high order. An elaborate supper was not the least enjoyable part of the programme. The success of the entertainment reflected much credit on the committees, which were constituted as follows:

Arrangement Committee: Paul Redieske, Thos. Conway, Alex. W. Murray, P. Sanders, G. A. Larson, T. P. Culloton, P. M. Murphy, J. B. Breen, C. C. Breyer. Reception Committee: Robert Griffith, D. J. Rock, David Whiteford, A. Joung, E. Baggot, T. C. Boyd, J. R. Alcock, J. G. Weber, Alex. Irona, C. J. Boyd, J. H. Roche. Floor Committee: Thos. Conway, Jas. H. De Viney, W. H. Cummins, J. A. Voltz, A. C. Hickey, C. J. Herbert, P. J. Morrisey, Wm. Gay, J. J. Doyle, J. G. Roland, Wm. T. Geary, R. Finn.

TRAPS AND VENTS.

THE MASTER PLUMBERS' ASSOCIATION of Holyoke, Mass , have appointed T. J. Carmody, C. P. Lyman, C. H. Tower and C. C. Kelly as a committee to arrange for the annual meeting of the State Association in May.

ON THE 6th inst. the Master Plumbers' Association of Iowa, in session at Des Moines, formulated a bill to be presented to the Legislature providing for the appointment of a State board of examiners under control of the State Board of Health to examine plumbers and issue licenses to graduates or skilled workers who can pass examination. Over 100 plumbers were in attendance at the convention, a number of whom were from Chicago.

A NEW PLUMBING SHOP has been opened by Eldreth Arnold, at 38 Miller street, Auburn, Maine.

THE BANGOR, MAINE, PLUMBERS recently held a meeting to talk over various matters regarding a permanent organization. At a meeting to be held Tuesday, February 13, the organization will be completed and the officers elected. J. W. Chamberlain is temporary president.

THE MASTER PLUMBERS' ASSOCIATION, Worcester, Mass., held their annual meeting at the Builders' Exchange, Tuesday, February 6. There were 18 present, President J. W. Jordan in the chair. The reports for the year were read, and the retiring officers made speeches. The following officers for 1894 were elected: President, James C. Luby; first vice-president, William F. Tucker; second vice-president, John F. Deedy, secretary, A. A. McLaughlin; treasurer, O. S. Kendall; secretary's clerk, C. C. Brown.

AT THE LAST REGULAR MEETING of the Examining and Supervising Board of Plumbers and Plumbing of Rochester, N. Y., the following officers were elected for the ensuing year: George H. Caffery, president; J. Alfred O'Kane, secretary.

WOMBOLD BROS. have opened up a gas and steam fitting shop at the corner of Hendricks and Fourteenth streets, Anderson, Ind.

SEYMOUR J. WILLIAMS of Petersham, Mass., has bought a plumbing shop and stove store in Greenfield.

J. W. CHAMBERLAIN & Co., plumbers and steam fitters, have removed to their new quarters in the Columbia Building, Bangor, Maine.

GEORGE AMES has moved his plumbing shop from South Quincy to the basement of the Court Room Building, Quincy, Mass.

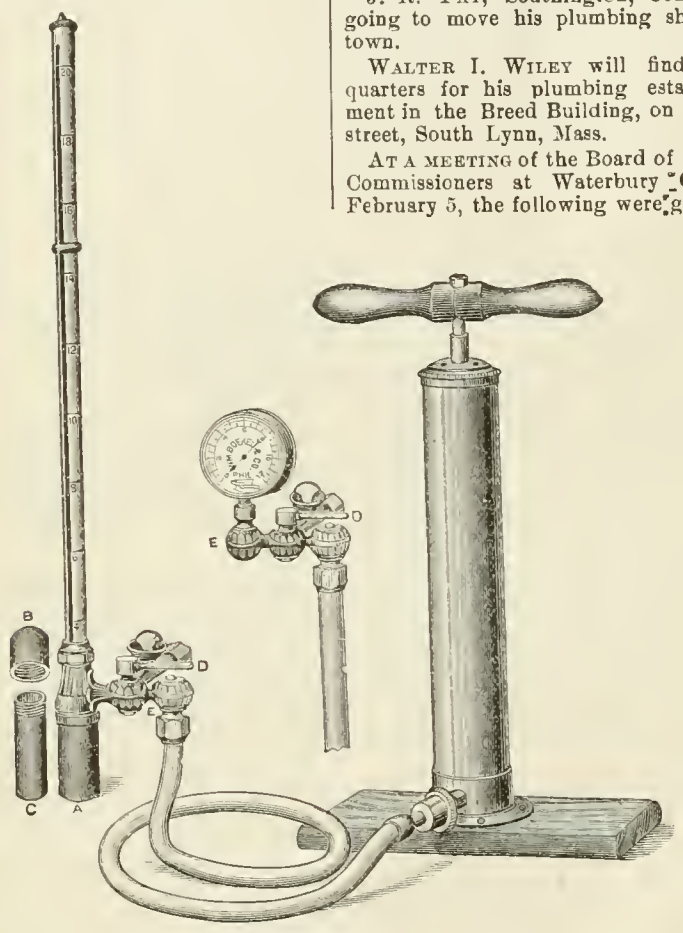
D. W. SPERRY has purchased a half interest in the plumbing business of Clefton Bros., Owatonna, Minn. The name of the new firm is Clefton Bros. & Sperry.

AT THE LAST SESSION of the Council of Jersey City, N. J., plumbers' licenses were granted to A. B. Dickinson, John Mitchell, George Mitchell, John J. Keilt and John P. Langan to make connection with the water mains of Jersey City and also to do general plumbing work when they file the required bond in the office of the Permit Clerk.

THE WORCESTER, MASS., BOARD OF EXAMINERS OF PLUMBERS, consisting of Charles H. Peck, Dr. L. F. Woodward and John F. McCartney met recently and opened the papers of the six persons who applied for licenses to engage in the plumbing business, and who took the examination before the board held Friday, January 26. The examination consisted of 25 questions pertaining to almost every detail connected with sanitary and practical plumbing. Another test was the dissection of a chart containing all the defects that are to be found in ordinary, every-day plumbing work. The examiners have reported to

the Board of Health that the following men have proved their proficiency and are eligible for licenses: Martin Delaney, 2 Mason street; Willard A. Parker. Nashua, N. H.; Davis Krischer, 24 Water street; E. D. Sisson, 205 Main street.

Secretary Geo. W. Leete of the Examining Board of Plumbers of Brooklyn, N. Y., recently appeared at the Gates Avenue Police Court against a master plumber who was accused of following his trade without the necessary sanction of the Examining Board. A fine of $10 was inflicted and the plumber went on record as the first man convicted in Brooklyn under the new State law. Secretary Leete also took out warrants for several other plumbers, and the board proposes to secure warrants for every man in the city of Brooklyn who, as far as can be ascertained, is pursuing the trade of a plumber without the necessary permission.



Improved Gas Fitters' Test Pump.

Fred Bowers has bought the Worster Building, between Sixth and Seventh avenues, Emporia, Kan., and has moved his plumbing establishment into it.

The annual meeting of the Master Plumbers' Association of Rochester, N. Y., was held February 2, and the following officers chosen for the ensuing year: President, William G. Reid; vice-president, James Tanner; financial secretary, William Wiedman; corresponding secretary, Frank Rosney; recording secretary, James Barr; treasurer, James O'Conner; sergeant-at-arms, John Walsh; Board of Directors, John Creelman, John Walsh, James Barr, James Tanner, George Foster; delegates to State convention at Buffalo, N. Y., March 6, James Maher, John Creelman and William Wiedman.

Chas. Franke will open a plumbing shop in Bellaire, Ohio.

B. P. Bower & Co., Cleveland, Ohio, issue a circular illustrating the Bower sewer gas trap, which they manufacture. They also embody a notice to the effect that they control United States patent No. 327,126, and that they will prosecute infringers.

Turner & Dayton, plumbers and gas fitters, have opened a store on West Sunset avenue, Asbury Park, N. J.

Frank M. Palmatier, Cobleskill, N. Y., has rented a building in the rear of the new bank, and will locate his plumbing shop there after April 1.

J. R. Fay, Southington, Conn., is going to move his plumbing shop up town.

Walter I. Wiley will find new quarters for his plumbing establishment in the Breed Building, on South street, South Lynn, Mass.

At a meeting of the Board of Water Commissioners at Waterbury, Conn., February 5, the following were granted plumbers' licenses: Disley & Weyand, Michael Clancy, the H. W. Keeler Company, the Charles Thatcher Company, M. J. Daly, L. H. Toucey, W. E. Booth.

The Smith & Anthony Company, 48–54 Union street, Boston, Mass., are issuing catalogue "B" of Sanitas plumbing appliances and other specialties, which supersedes all other price-lists. The catalogue has a handsome cover, and is a fine piece of printing on enameled paper, showing the cuts to the best advantage. In turning over its 64 pages it is noticed that a sectional cut of the Sanitas Royal water closet is used for the first time, to show its construction and connections. This is followed by the various styles of the closets and the Sanitas Royal square top embossed closet. The Sanitas Crown is a new closet, known as the No. 3, made to meet the demand for something lower in price. The Sanitas Royal is the latest addition to their line of baths, and is a roll rim porcelain enameled iron Roman bath, decorated with gilt bands and provided with the newest appliances. The Sanitas oval valve basin is a novel departure in basin construction, a gate valve opening and closing the outlet at the side, leaving the bottom of the basin smooth. These are followed by the Sanitas lavatories, sinks, traps and plumbers' specialties in brass and iron. The S. & A. pipe band for tapping cement lined pipe is another novelty. The Marshall automatic hot soda and hot water apparatus for gas fuel is designed for use where a continuous supply of hot water is not needed. This is a new apparatus and said to deliver water at any desired temperature from 130° up to boiling temperature. The last page shows a view of their iron foundries and machine shops and brass foundries and finishing works at Wakefield, Mass. The company have finely arranged showrooms at 54 Beekman street, New York, and at 217 Lake street, Chicago.

McMann & Taylor, 42 Cliff street, New York, are closing their first year in business by issuing a cloth bound catalogue of 200 pages devoted to goods used by the steam and hot water and plumbing trades. They state that this catalogue is a selection of the leading and staple goods and that it is to be followed by a larger and more complete catalogue as soon as it can be prepared. Prices and information are given of pipe, cast and malleable fittings, recessed drainage fittings, pipe hangers, valves of all kinds, steam and pressure gauges and regulators, suction, force and pressure pumps, pipe cutting and threading tools and machinery, pipe tools and vises, engineers' and firemens' tools, plumbers' brass goods, lead pipe and traps and cast soil pipes. At the back of the book is an excellent index.

Thos. C. Casey has been elected secretary and treasurer of the McCambridge Company, Limited, Philadelphia. Mr. Casey is a son of the late secretary and treasurer, whose death we recorded last week.

Improved Gas Fitters' Test Pump.

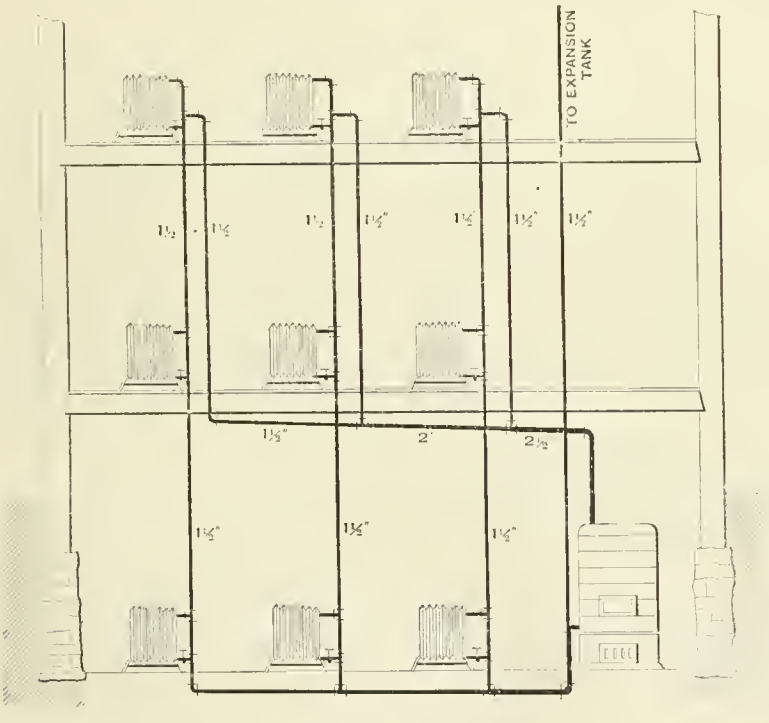
The accompanying illustration is of a gas fitter's test pump which Wm. Boekel & Co. of Philadelphia are putting on the market. The pump is combined with an improved mercury and spring test gauge. The mercury test gauge consists of a mercury cup, ether cup, stop cock and mercury column. A shows the mercury cup made of iron and threaded so as to screw into the lower part of the gauge. When not in use the cup may be unscrewed and closed with the screw cap B, to prevent loss of mercury. C is a piece of gas pipe for attachment to the gauge after the mercury cup is taken off for protection to the projecting glass tube. D is a stop cock to shut off the air. E shows the pump in combination with the spring test gauges. The pump is strongly made of brass with metal valves.

The advantages claimed for this pump are that all the brass work in the mercury gauge is above the mercury, thus obviating the possibility of damage to the brass work through spilling of the mercury. The mercury cup is readily unscrewed, closed with the cap and deposited in a tool bag, dispensing with the old method of removing the cup from the chamber, pouring the mercury into a ladle and carrying it in a pocket. The column is conveniently graduated, and the dial of the gauge is 2½ inches in diameter. The makers have applied for a patent on the article.

STEAM AND HOT WATER.

Piping a Hot Water Job.

From P. C. & C., *St John, N. B.*— If "R. E. M.," in *The Metal Worker* of January 20, will adopt the following plan he will have no difficulty in circulation. Instead of running separate risers for each radiator he should run 1½-inch pipe to second floor, say 10 inches above the floor. Make a return with a 1½-inch elbow and nipple into branch of 1½ x 1 x 1½ inch tee. Extend 1-inch pipe from tee to top of upper radiator, making ample provision for air tap, or extend small pipe above tank. Connect return of radiator with return at floor and drop 1½ inch pipe to ground floor, having two tees in



Piping a Hot Water Job.

first floor for top and bottom connections of radiators. At ground floor make similar connections, having the pipe drop some distance below radiator before running under floor or along base. Reduce main to 2 inches, as suggested, and run a similar 1½ inch pipe as above described for second tier of radiators; then reduce the main to 1½ inches and carry it along to line of third tier and run it directly to second floor and return it as with other riser. These three return pipes may be returned independently to boiler or branched into a large return main, corresponding with the flow main. To control ground floor radiators it may be found best to put valves in the return connection. We fitted a large building on this system with variation as the case required, and it works perfectly. You will observe this dispenses with much piping. You have positive circulation, and each radiator can be shut off without interference with the others, while all air is taken off at the top. Expansion tank should be connected direct to bottom of boiler.

From G. W. M., *Waynesboro, Pa.*— In answer to "R. E. M," in *The Metal Worker* of January 20, I would say that if he will put his expansion tank on top of the return pipe from the farthest radiator on the highest floor, and run the flow to low radiators direct from top of boiler, falling toward the farthest radiator, and carry return from low radiator to opposite side of boiler, putting an air valve on each radiator, he will have a fine working system. To locate expansion tank as shown would defeat the entire plan, as the hot water rising would take the course offering the least resistance and go overboard before the proper temperature could be reached in any of the radiators. I have paid for my experience in the way of time and labor, and a little knowledge of the first principles of circulation would dictate the above construction.

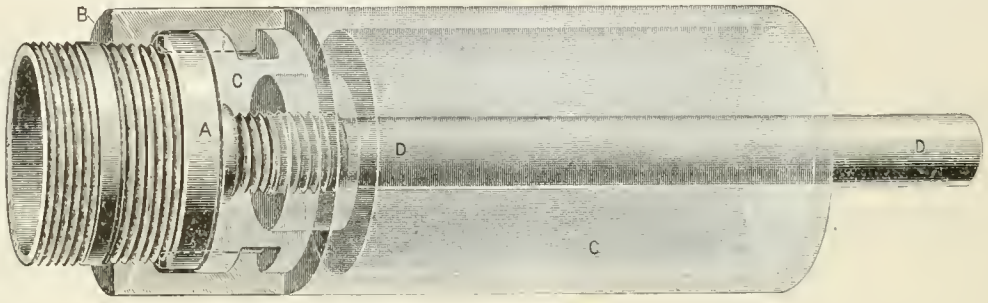
Questions About Boilers.

From STEAM FITTER, *Lowell, Mass.*— Will *The Metal Worker* please give me information on the following subjects? When a boiler carries 30 pounds of steam has the top or bottom the most pressure? What is meant by high and low pressure, and when does low pressure become high pressure? How often should a fusible safety plug be renewed, and what melting or fusing point is considered good practice? Is it good practice to place a check valve on return pipe of a heating job? What is the highest pressure you can carry on a boiler and return water to it? Give the best and most simple rule for estimating horse-power and grate surface required in a boiler and the size of chimney that should be used with it. How can you get the power of an engine? In setting a boiler should there be an air space in the brick work? What is the first thing to do with a heavy fire on and no water in the glass or gauges?

Answer.—The bottom of the boiler will receive the greatest pressure because it sustains the weight of the water as well as the pressure of the steam. A steam pressure of 15 pounds or above is generally considered high pressure. Low pressure boilers seldom use more than 10 pounds pressure. A fusible plug should be renewed when it has become so coated with sediment that it is not immediately affected by the temperature. As Banca tin is recommended for the purpose by some authorities, it should melt at about 400°, though alloys are used to make it melt at a lower temperature. The use of a check valve on the return is quite general with high pressure work. Its use in low pressure work depends on the opinion of the engineer installing the plant. Water can be returned to the boiler by the use of a return steam trap at any pressure which the apparatus is strong enough to carry. Authorities vary in computing horse-power, allowing, according to the construction of the boiler, from 6 to 20 feet of boiler surface to a horse-power, an average commonly used being 16 feet, and a grate surface of 1 square foot for from 4 to 8 feet of boiler surface. Rules for determining the size of chimney must be applied with so much judgment and are so cumbersome in calculation that experience is sought in preference by some authorities. Boilers which set so that the outer wall of a building forms one of its walls should have an air space in its brick work, otherwise the ground on the outside of the wall will absorb a considerable amount of heat from the boiler. When the water is low, with a heavy fire on, the best thing to do is to extinguish the fire by covering with ashes, or in the absence of ashes with fresh fuel, and shut off the draft, as the delay caused in drawing it and the increased heat during the operation might prove disastrous. In calculating the horse-power of an engine, multiply the mean pressure in the cylinder by the area of the cylinder and the speed of the piston in feet per minute, and divide the result by 33,000.

New Nipple Holder.

Curtia & Curtis, Bridgeport, Conn., have just placed on the market a new nipple holder, shown in the accompanying illustrations. The special object sought in this device is to make a holder that would be cheap, of small diameter so that it could be used in a pipe machine and at the same time be capable of taking a large range of sizes and not require the use of a hammer or other tool. Fig. 1 is a transparent view showing the working of the holder, while Fig. 2 shows one of the sockets which is a part of the holder, these sockets being made in different sizes to fit the various sizes of nipples. To operate the holder the socket B, Fig. 1, of the proper size of pipe to be cut is screwed to the body C by a one-eighth turn and the screw D is run forward by a wheel provided for the purpose. The nipple is then secured as shown in the cut, but is so arranged that it bottoms on the plunger A before it jams in the thread and is thus held securely. To release the nipple, a part revolution of the screw D will allow it to be removed by the fingers. These holders can either be used in a vise with a common die stock or with any of the pipe machines now on the market. The firm also mention that they can be used with their Forbes patent die stock. To meet



New Nipple Holder.—Fig. 1.—Transparent View of Holder.

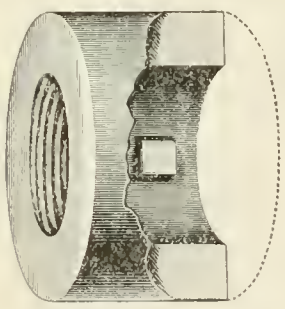


Fig. 2.—Broken View of Socket.

the requirements of the common style of overhung spindle machines, Curtis & Curtis have adapted this same principle to a holder intended for their use. Either right or left threads can be made with equal ease, and at a very slight expense sockets for any unusual size thread required can be provided. They are now made in various sizes up to a capacity for 6-inch pipe, but they can be made to any required size.

Steam Heating Queries.

From L. T. W., *Rockport, Mass.*—Would you please give me information in *The Metal Worker* about steam heating? In apportioning the radiating surface for a steam heating job in lower rooms is it calculated by the same method when the radiators or coils are suspended from the ceiling as when the radiators are placed upon the floor? Can a steam trap for returning condensed steam to the boiler be used with an apparatus carrying from 2 to 5 pounds pressure when the radiators are on a level with the boiler? Are steel traps used on low pressure boilers, or only on high pressure boilers?

Answer.—The same rules are used for apportioning the amount of surface required whether the coils are placed at the ceiling or at the floor. A return or lift steam trap will not work successfully on so low a pressure as is mentioned, although, when everything is working properly and the water does not have to be raised more than it would from a radiator set on a level with the boiler of the ordinary house heating pattern, it is possible for the water to be returned at so low a pressure as 5 pounds. In general practice no attempt is made to return the water at a less pressure than 10 pounds or above. Such traps are generally used in connection with high pressure heating jobs, and their use with low pressure work is exceptional.

Radiator on Boiler Level.

From J. W. H., *Montreal, Can.*—Writing from the city that I think, with truth, can be said to be the home of modern hot water heating as applied to domestic use, anything on the subject from those at a distance is of great interest. I note the communication of A. E. Edgar, in *The Metal Worker* of January 27, on what was at one time (some years ago) a very live question, viz, returning the circulation from radiators at or below the level of the returns on the boiler. Such a system of connections as shown in the cut presented with his letter would not be considered good practice here, as it mixes up on the one line of flow pipes radiators fitted on three different stories. In mild weather, when small fires are desirable and it is wished to have the radiators circulating with water at a very low temperature, the radiators on the top flat would rob the lower level radiators, and if compelled to pass through the lowest radiator, by closing valve B on the by pass it would be of such a low temperature as to be of little service as a heating medium. Again, as compared with a simple syphon direct from boiler, it is a complication requiring care in the proper manipulation of valves, and unless the length between points A A was considerable it would not be a great while before some of the joints in the vicinity of top radiator would be apt to develop serious leaks, if the fitting were not broken entirely by the expansion. This sort of trouble has frequently occurred when the cause was not nearly so great as a connection made as shown by your correspondent. Specifications here for good work invariably read that each flat must have a separate and independent main, not in any way connected with any flat on a different level, running direct from boiler.

While no rule can be made to cover all cases, the general principles controlling hot water circulation are fixed and unalterable, and one of them is that given a radiator, or set of radiators, on a high level connected to a main supplying radiators on a lower level, they will rob the radiators on the lower level when mild firing is required. That is, they will take all, or nearly all, the heat there is, letting the lower level radiators remain cold or nearly so. When each set of radiators on the different floors are supplied directly from the boiler, they will each get their proper share. I hope I have said enough to promote interest in the question and call for further discussion, as it is only by rubbing our wits one against the other that they are sharpened.

Indirect Car Heating.

From a foreign exchange the following is taken: A new system for heating and ventilating trains is being tried on the North British Railway, which, according to report, promises to give good results. Each vehicle is fitted with a pipe or air shaft which passes under the under frame, and from thence up through the roof of the vehicle. Both ends of these pipes are provided with hoods, which can be turned so as to catch the air. A steam pipe from the engine, supplied by the exhaust from the Westinghouse brake, passes along the whole length of the train and enters the air shafts, and thus the stream of air forced through the air shaft by the motion of the train is warmed before it passes into the compartments by means of the branch pipes. Owing to the air in the carriage constantly being changed an efficient system of ventilation is provided. The apparatus has also been tried on the Caledonian Railway and favorable reports have been received.

HEATING NOTES.

In our Trade Report this week will be found an item of more than usual interest to the steam and hot water heating trades. It is the new price-list of radiators just put out by the American Radiator Company. The full list is printed so that comparisons

can be made with the prices previously ruling and the reductions noted.

James P. Marsh & Co., 224 and 226 Washington street, Chicago, have issued a new catalogue descriptive of their air valves and pressure gauges. The catalogue comprises 16 pages and treats of Marsh's Acme automatic air valves, altitude gauges, steam and ammonia gauges, &c. The low pressure air valves cover a variety of sizes for air, steam and water, shutting off steam and water automatically. The No. 6 is designed for direct radiators, shuts off steam by expansion and water by flotation, and is made to circulate the condensed steam or water. This is accomplished by a divided passageway, so that the condensation is syphoned back into the radiator. The No. 3A has a large evaporating cup or air moistener, to take care of the condensation that sometimes escapes the valve seat. The improved No. 2 valve does away with the running joint from valve to drip pipe heretofore used and is specially adapted to the vacuum system. Other styles made also have special points. The altitude gauge shows the hight of water in hot water heating apparatus, indicating it accurately at the boiler. Edw. F. Keating, 75 John street, New York, is Eastern agent.

The United States Heater Company of Detroit, Mich., have elected the following officers for this year: President, Geo. A. Ducharme; first vice-president, A. T. Henderson; second vice-president, Jno. W. Mills; secretary, H. A. Smith; treasurer, Henry T. Cole. Mr. Ducharme is a prominent stockholder in the company who has been prevailed upon to take a more active post in the management.

The Jower Steam Heating Company of Brooklyn, N. Y., is a concern that was incorporated recently, with a capital of $20,000. The directors named are Charles Jower, William H. Jower, Marie Jower, Louise M. Helmle and Frank J. Helmle of Brooklyn.

The Armstrong Mfg. Company, Bridgeport, Conn., manufacturers of water, gas and steam fitters' tools, have removed their New York headquarters from 242 Canal street to the Cornell Building, 139 Centre street, where they will carry a full line of the well-known goods of their manufacture. The new offices are finely appointed, commodious and in every way suited to the large business done by the company.

The American Radiator Company, 92 Centre street, New York, are making preparations to secure a generous share of the radiator trade this year. W. H. Hill and W. P. Jenkins are additions to their corps of salesmen, and a large warehouse, with 45,000 feet of floor space, is being erected at Harrison, N. J., convenient to all the principal railroads, so that orders may receive prompt attention.

W. A. Russell has accepted the position of consulting engineer on heating and ventilation with the American Boiler Company, 94 Centre street, New York.

Hazen Mooers died early Saturday morning, February 3, at the family residence, 421 Juneau place, Milwaukee, Wis. Mr. Mooers was 69 years of age and had lived in Milwaukee since 1842. He was born in Clinton County, N. Y. For several years Mr. Mooers resided at Green Bay, but afterward he returned to Milwaukee and engaged in the steam fitting business. He was the senior partner in the firm of H. Mooers & Co.

The Wells & Newton Company are to occupy their new office on the ground floor of the Monadnock Building, 274 Dearborn street, Chicago.

The Ashley Nipple Holder.

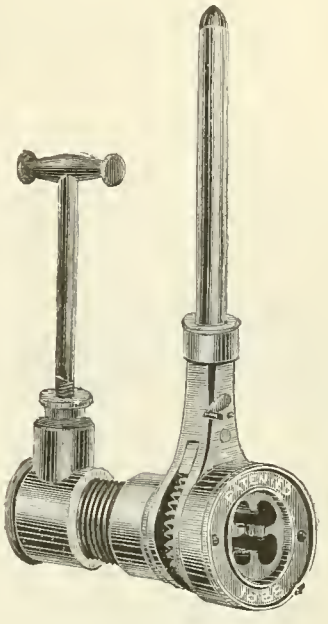
In order to adapt this holder for machine use the Walworth Mfg. Company of 16 Oliver street, Boston, shrink upon the square shank, shown in the small engraving, a piece of extra pipe of the length of the machine cylinder, extending the follower bolt to correspond. This permits the sleeve and hexagon collar to come without the face of the gripping chuck of the machine, while the head of the follower extends beyond the end of the cylinder. By this arrangement the operator is able to set up and release the nipple or change the sleeves without disturbing the shank of the holder. In cases where the speed is moderate these changes can be made without stopping the machine.

The different sleeves (or heads) corresponding to the size of pipe, being interchangeable, are easily screwed on to the shank by hand, when the hexagon collar, sliding along the square shank, fits over the hexagon end of the sleeve, securely holding it from turning either way, and taking the strain off the sleeve and shank thread. The piece of pipe to be threaded is screwed into the holder; the teeth on the face of the non-rotary follower within the sleeve (shown in small cut) are forced in contact with the end of the pipe by turning up the follower bolt, which prevents the pipe or nipple from turning in either direction, thus permitting the cutting of right or left hand threads. The holder being placed in a vise, the die is applied in the usual manner. The round end of the holder will enter the head of the die stock, so that the die may be run on until it comes in contact with the end of the holder, if desired, so that the shortest possible nipple required may be cut.

THE ASHLEY NIPPLE HOLDER.

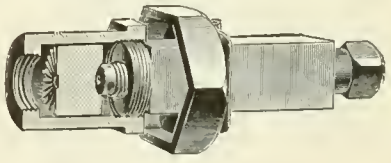
Climax Ratchet Stock.

Clarence M. Kemp, Baltimore, Md., is offering a ratchet stock, as shown in the accompanying cut. The tool is made entirely of malleable iron and steel, and is designed to be light enough in weight to be comfortably carried in a tool bag, and at the same time strong and heavy enough to stand hard usage and rough treatment. A feature of the tool is a vise attachment, which is located at the lower end of the handle, at the left of the cut. In operation the tool is slipped on the pipe to be threaded until the end of the pipe comes in contact with the die, and the handle is screwed up so the vise firmly grips the pipe. The ratchet handle is then rotated, which revolves the die, and by means of the leading thread carries the die on the pipe, cutting the thread. By reversing the pawl and moving the handle reversely the die runs off the pipe. It is explained that with this tool it is not necessary to dig up or take out the whole lengths of pipe, as the defective parts of the pipe



Climax Ratchet Stock.

can be cut out and the threads cut on the pieces in the ground with the greatest ease and convenience, not only saving time, but avoiding much unnecessary and disagreeable work. The manufacturer states that every tool is guaranteed, and any part can be duplicated if necessary; also that dies, if furnished, are extra. The tool is made in two sizes: No. 1, threading ¼ to 1 inch pipe, taking dies 2 or 2½ inches square; No. 2, threading 1¼ to 2 inch pipe, taking dies 4 inches square.



Holder Detached.

The American Copper & Brass Works of Cincinnati, Ohio, have just secured the contract for the copper work in the large anti-trust distillery about to be erected in Terre Haute, Ind. Randolph & Clowes of Waterbury, Conn., will furnish all the sheet copper and seamless drawn tubes used in the work. It is claimed that this is the largest single contract for this class of work hat has ever been placed.

Brick manufacturers of New York, New Jersey and Long Island will, it is said, form a trust.

The Legislature of Utah has passed a resolution protesting against that portion of the Wilson bill which affects the duty on lead ore.

TIN PLATES.

The British Tin Plate Trade.

The state of the British tin plate trade is by all accounts very discouraging, while the outlook for improvement is gloomy. In his report on the trade, the Liverpool correspondent of the London *Ironmonger*, under date of January 27, says that the market has been more idle than ever before, and there is no doubt that the trade is in a very bad way. Several works in South Wales which are now closed have, he says, avowed their intention to restart if they could book 2000 boxes at a price which would cover cost, but so far they have failed to do so. Both Siemens and Bessemer plates are offering in Liverpool at lower prices than have ever been accepted without finding buyers, "the only response being an offer of 6 pence a box less." The South Wales makers whose establishments are now in operation find it difficult to keep their works employed, and the *Western Mail* of Cardiff, a journal that is perhaps the foremost authority in the tin plate trade, states that over 5000 tin platers, including boys and girls, in the South Wales district, are idle, besides a large number of persons connected with other industries depending upon the tin plate trade. The loss in wages to those directly engaged in the trade is put by the *Mail* at over $57,600 weekly, while the employers' loss, at the low estimate of 6 pence per box, and taking into account the standing charges, cannot be placed at less than $20,000 weekly. These figures are based on the output of 160 mills now lying idle. The *Mail* franky acknowledges the competition of the American tin plate makers in the United States, and strongly urges the British manufacturers to turn their attention to the development of other markets for their product.

Tin Plate News.

The announcement is made from Elwood, Ind., that Col. A. L. Conger, president of the American Tin Plate Company, has disposed of his entire interest in the plant to W. B. Leeds of Richmond, Ind. Mr. Leeds was already a large stockholder in the concern, and this sale will give him the controlling interest. Colonel Conger, associated with some English capitalists, will make arrangements to build another tin plate works at the same place.

The Emlyn Iron & Steel Rolling Mills have arranged for their new plant at Summitville, Ind., and work has already begun on the foundations. The black sheets made by them will be tinned by the Chicago Tin Plate Works, which will form part of the same enterprise. Substantial buildings of brick, iron and stone will be erected, one of which is to be 200 x 80 feet, and two others will each be 150 x 80 feet. It was at one time reported that C. C. Clark and S. W. Allerton of Chicago were interested in these works, but both of them deny it. J. E. Jones is prominent in the movement.

At a meeting of the directors of the American Tin Plate Company, at Elwood, on the 3d inst., it was decided to increase the capacity of the plant to twice its present output, making it a ten-mill plant.

The Chicago Stamping Company are installing a tin plate plant in their factory in that city. They have put up two Phillips pots, and will add more as rapidly as they can get the tinning department in good running order. It is their intention to manufacture not only all the tin plate needed for their own consumption but also to enter the general market.

Norton Brothers of Chicago will shortly begin the manufacture of terne plate, introducing special features, which they believe will enable them to turn out a very superior quality of roofing plate.

SCRAP.

J. M. & L. A. Osborn, Cleveland, Ohio, have brought out a brand of terne plate under the name Eureka, which they say will rank with the best rolled plates in quality. The firm, besides making allusion to the excellent qualities of these plates, mention that they will be put on the market at a low price. They advise us furthermore that their line of roofing plates comprises 20 well-known brands.

Probably the lowest prices ever fetched by tin plates were recorded at Swansea, Wales, the other day, when 4175 boxes of coke plates from the Ysgitty Works, Langhor, were sold by auction, and realized an average of 6 shillings 9 pence, or $1.62, a box. The low figure is explained by the age of the plates, which had been stored in the Swansea Harbor warehouses for years, the Ysgitty Works having suspended operations some time ago.

Turkey uses about 500 tons of bright tin plates annually, all of which is imported from England. The only size handled is 20 x 14 in 100-pound boxes, containing 112 sheets. The gauge marks are peculiar to the Turkish trade, consisting of three, namely, I C, I C W and I C W W respectively. No terne plates are used in the Ottoman Empire.

The value of pig tin imported into Great Britain in 1893 was $12,312,355. Of this amount, $8,104,137 worth was re-exported to the United States and other countries, as well as $2,910,326 worth of native English tin.

At a meeting of the Board of Directors of the American Tin Plate Company, Elwood, Ind., held on February 4, under the presidency of A. L. Conger, president of the concern, it was decided to double the capacity of the plant. It has been found impossible to fill orders at the present rate of production—3000 boxes a week—but the increased facilities decided on will give a capacity of 1000 boxes a day, with employment for about 700 men.

A member of the trade who has recently accomplished a Western business tour in the course of which he inspected most of the large tin plate works west of the Alleghanies, reports a gratifying degree of activity among them. Orders in that section appear to be fully equal to their present capacity for production, in respect of both bright and terne plates, and in more than one instance makers mentioned their inability to meet the demand for goods to fill immediate needs. The outlook for the domestic tin plate industry in the West is generally regarded as favorable.

Mortimer H. Cort, lately a member of the well-known tin plate and metal firm of N. L. Cort & Co. of this city, who has recently opened a business as importer and dealer in tin plate, pig tin, sheet iron, zinc, &c., at 9 Burling alip, New York, is offering the trade a line of American bright and roofing plates made expressly for him. They include Iona, a bright charcoal plate, Alloway grade, made in standard sizes, IC and IX, and four qualities of terne plates, namely, Atlantic, Vigilant and Pacific, Worcester grade, and Dane of Dean grade, made in IC, 14 x 20.

The new tin plate plant which Hughes & Patterson, Philadelphia, have added to their works has started into operation with a few pots. The product at present is merely of a trial character and limited in volume. The establishment, however, is on a large scale, and will when complete be one of the most important tin plate works in the East.

The black plate department of Marshall Bros. & Co.'s Works, Philadelphia, is kept very busy on material for tinning purposes. A portion of the product is used by Messrs. Marshall in their own tin plate works, and the remainder is in great demand by other domestic tin plate manufacturers.

Imports of tin plate at San Francisco, Cal., during 1893 amounted to 40,068,735 pounds, valued at $1,155,672. During the same period 1,883,337 pounds of pig tin were entered at that port, the value of which was $378,362.

A cable dispatch from London intimates that a number of leading business men engaged in trade at Swansea, Wales, are negotiating for the formation of a direct line of steamers to carry the trade between Swansea and America. The former is the principal British tin plate shipping port, and is close to the largest tin plate works of South Wales.

To reduce the risk of fire at sea, the White Star Line will carry no more cotton on their transatlantic passenger steamers.

THE RETAIL STORE.

Representative Stove Dealers in Westchester County, N. Y.

The following notes from a correspondent concerning some of the representative dealers in stoves and hardware may prove interesting to our readers :

At White Plains will be found Charles P. Sherwood, who has one of the finest hardware and stove stores in the State. He devotes considerable time to the management of the business, and having had a large experience in this line, through his connection with the Richardson & Boynton company, possesses a correct idea of what a model retail hardware and stove store should be. The large bevel plate glass show windows are always tastefully arranged so as to attract the eye of the passer by. All shelf hardware being incased in boxes with samples on the outside, keeps the stock clean and always in its place. The counters are of hardwood, finished on top with mahogany. The ceilings are of the paneled type, from which hangs the stock of lamps, which is claimed to be the finest in the county. Mr. Sherwood makes a specialty of Richardson & Boynton's furnaces, and the Michigan Stove Company's and Eugene Munsell & Co.'s ranges and parlor stoves. The stove department is on the second floor.

T. S. Nedham, who occupies the store on the corner of Main and Center streets, enjoys a large trade, making a specialty of Boynton furnaces and Rathbone, Sard & Co.'s and Phillips & Clark's parlor stoves and ranges. Mr. Miller, the head salesman, has a great many friends in the vicinity of White Plains and draws considerable trade from his old acquaintances.

W. H. Sniffen enjoys the reputation of being a hustler. If there is any furnace or range to go in within a radius of 10 miles Mr. Sniffen is after it, and has had great success with Barstow Stove Company's Bay State furnaces. He also makes a drive on Orr, Painter & Co.'s Sunshine double heaters, having had a large trade in this line during the past season. Mr. Sniffen has a great many friends among the stove salesmen and they all like to spend a few hours with him.

R. T. Young of Tuckahoe runs a general store and during the season sells a good many ranges and parlor stoves made by Eugene Munsell & Co. and the Peekskill Stove Company.

George W. Robertson & Co. are at this place and make a specialty of Perry & Co 's Argand stoves and ranges. Mr. Robertson was formerly with George D. Furgeson & Co. of Mount Vernon, with whom he learned the business.

At Unionville George W. Quinby has a stove store, selling the goods of the Union Stove Works and Eugene Munsell & Co. Mr. Quinby devotes most of his time to plumbing and tinning, as there are many new jobs at Sherman and Kensico Parks, there having been over 200 homes erected in that vicinity last season.

At Pleasantville there are two stove dealers, W. T. Bailey, who makes a specialty of Eugene Munsell & Co.'s goods, and George W. Taylor, who sells Barstow Stove Company's line.

At Chappaqua, the home of Uncle Horace Greeley, J. T. Tompkins enjoys a good tin and stove business, selling Orr, Painter & Co.'s line of Sunshine ranges and stoves. Mr. Tompkins has been in that section for a great many years and remembers way back when we were all boys.

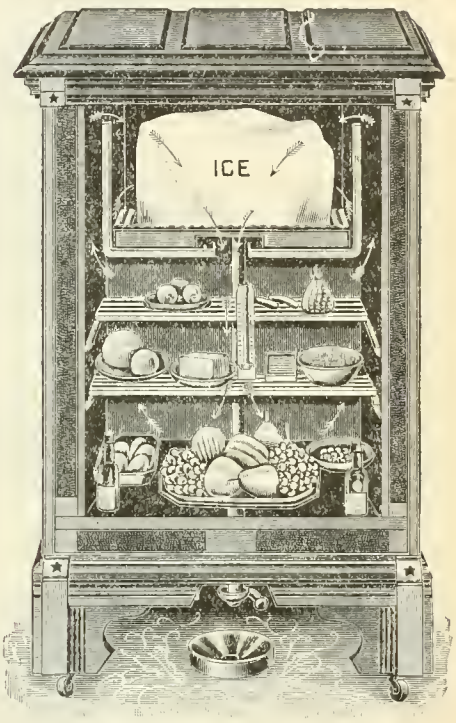
At Mount Kisco Ganun & Davis have what is considered the largest hardware and stove store between White Plains and Chatham on the Harlem Railroad. Centrally located, in the midst of a farming section, they enjoy a very large country trade as well as that of the village. Their leading lines of stoves comprise the Sunshine, Andes and Manhattan. They have recently added a grocery department to their store. Mr. Ganun manages the stove and plumbing departments, while Mr. Davis attends to the office work, doing most of the buying and managing the sales department.

J. H. Reynolds, at Bedford Station, makes a specialty of Argand, Manhattan and West Shore ranges and stoves, besides doing a general tinning and plumbing business.

H. W. Kellogg, successor to Kellogg & Elliott, is at Katonah. He carries a complete line of hardware, making a specialty of Perry & Co.'s Argand and Phillips & Clark's Andes ranges and stoves. Mr. Kellogg is also largely interested in the silk factory at Katonah, and is a great worker in the County Committee of the Republican party.

The North Star Refrigerator.

The accompanying cut illustrates an ingenious method adopted to demonstrate the peculiar points of the North Star refrigerator, manufactured by the G. M. Shirk Mfg. Company, 112 and 114 Lake street, Chicago. It was first tried at the World's Fair, and proved so successful and attracted so much attention that similar specimens have been furnished to the company's agents for show purposes. The cut shows one of the company's regular sizes of refrigerators, from which the back was removed and two panes of heavy glass inserted, with an air space of 1⅛ inches between them. This leaves the refrigerator in good working condition, but exposes the contents to full view, including the ice chamber, and at the same time shows how the walls of the sides are constructed. A refrigerator thus arranged was run for four months continuously at the World's Fair, with a thermometer inside to show the temperature. It contained various kinds of provisions, including tomatoes, eggs, butter and salt, also matches, which were kept dry. The tomatoes were changed but twice during the entire time, keeping perfectly fresh, and the eggs, which had been kept the entire time, were cooked and eaten at the close of the exposition. The temperature ranged from 39° to 40°, and the consumption of ice was 10 pounds daily, according to ice bills. The refrigerators

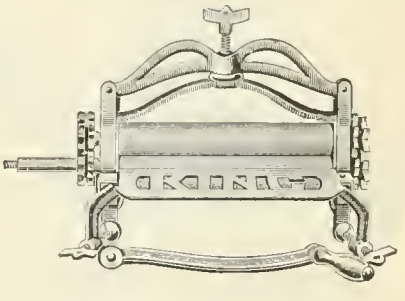


The North Star Refrigerator.

made in this way for show purposes are 45 inches high and 30 inches wide.

The King Wringer.

The accompanying cut represents an iron frame wringer, offered by the National Wringer & Mfg. Co., Canton, Ohio. The frame is entirely of iron and steel, every part being galvanized to render it rust proof, and is made with smooth iron bearings to make the wringer easy of operation. The springs are of oil tempered steel, which, it is



The King Wringer.

stated, are tested to 1500 pounds pressure. The rollers are referred to as being of the best quality of white rubber, solid through to the shaft, no twine or wire being used, vulcanized, and warranted by the makers not to become loose. The rolls are adjusted by a top screw in the center to insure an abso-

lutely even pressure on all parts of the rolls. The wringer is fitted with guides to prevent the clothes from running in between the frame and the end of the rolls. Particular attention is called to the fact that the wringer has gear wheels; also that it has all the features

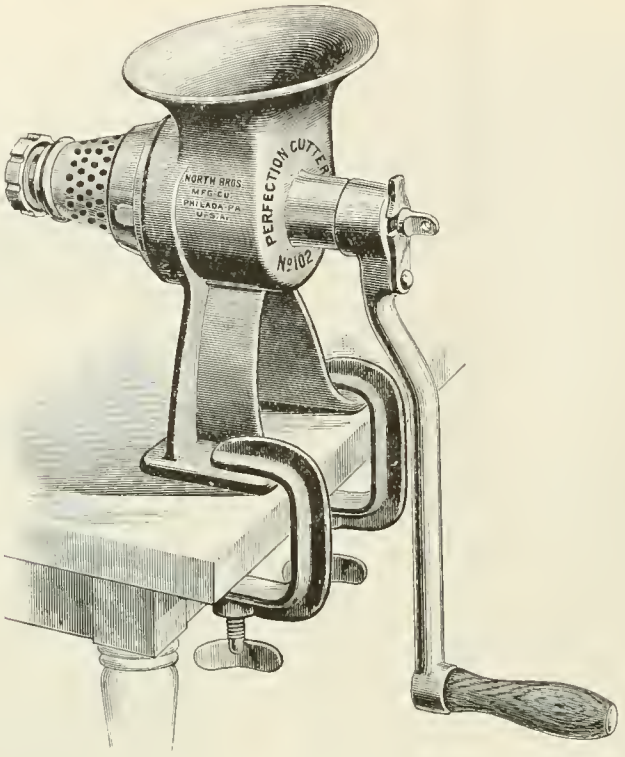


Fig. 1.—The New Perfection Cutter.

of all wood or iron frame wringers, besides many improvements. It is remarked that the King is an improvement over the Erie wringer made by this company, and is patented; patents on both wringers belonging to the company.

The New Perfection Cutter.

North Brothers Mfg. Company, Philadelphia, Pa., for whom John H. Graham & Co., 113 Chambers street, New York, are agents, are offering the cutter herewith illustrated as an improvement on the Perfection cutter

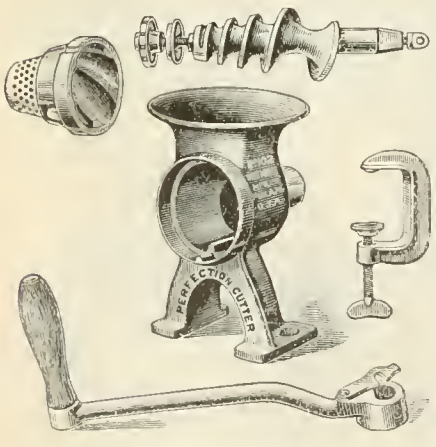
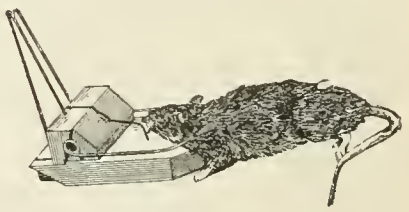


Fig. 2.—Parts of Perfection Cutter.

Nos. 1, 2 and 3. As improved the adjustment of the cone and the cutting screw is made by a nut and washer at the end of the cutting screw. As shown in Fig. 2, the cone is placed on the cutting screw, followed by a washer and nut, and the nut is screwed up tight, thus bringing the parts in close contact and ready for cutting. The adjustment is entirely confined to the cone and the cutting screw. It is explained that the frame becomes simply a convenience for holding the parts, so that the screw can be turned by the crank and the meat, &c., conducted into the parts to be cut. The hopper on the frame has been enlarged and the cutting parts raised higher from the table to allow more room for dishes, &c., to be placed under the machine. Another improvement has been made in attaching the crank. The crank and the shaft have corresponding flat surfaces, so that to take the cutter apart the thumb screw at the end of the shaft is given a half turn, the catch pushed to one side, when the crank can be taken off and all parts taken from the cutter. It is pointed out that in the construction special care has been taken to arrange every part of the machine so it can be easily reached with the fingers for cleaning. The machine is held in place on the table, either temporarily by two clamps furnished with each machine or permanently by screws, for which holes are drilled in the base, thus enabling the same cutter to be fastened either way. In use the meat, &c., to be cut is dropped in either large or small pieces, as desired. The pieces are forced forward by the screw to the cone, where they are cut between the sharp edges of the revolving screw and those of the stationary oblique knives in the cone, and finally to a uniform size by a further cutting in passing through the holes in the cone. It is stated that the work of cutting is thus advantageously divided, and that all unnecessary friction and waste of power is a voided. Any wear that may take place in the course of time in the cone or cutting screw is always taken up in putting the cone in the machine, and such wear, it is stated, instead of dulling the cutting edges, sharpens them. The cone furnished regularly with the machine has holes $\frac{5}{32}$ inch in diameter. Cones with holes $\frac{1}{12}$, $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$ or $\frac{3}{8}$ inch in diameter will be furnished when desired. It is stated that the machine will cut cooked meats of all kinds, chicken, lobsters, oysters, hash, suet, codfish, material for mince pies and fruit cakes, almonds, cocoanuts, stale bread, crackers, vegetables, raw meats, &c. The manufacturers state that in the new machine all the objectionable features in Nos. 1, 2 and 3 machines have been overcome. The present cutter is made in two sizes: No. 101, to cut 1 pound per minute, and No. 102, to cut 2 pounds per minute.

The Daisy Rat Trap.

The National Wringer & Mfg. Co., Canton, Ohio, are introducing the rat trap illustrated herewith. The steel springs are referred to as powerful and as

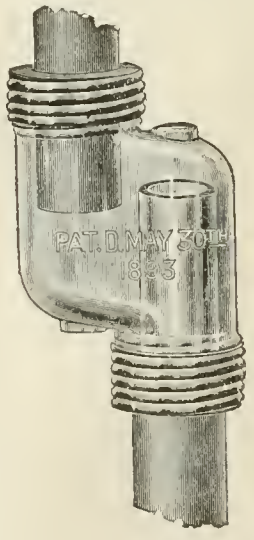


The Daisy Rat Trap.

always effective. The trap is sprung by moving the bait sideways or raising it. The trap is not inclosed, allowing the rat to enter from any side. The traps are fully warranted by the manufacturers to give satisfaction, and are packed one dozen in a crate.

The Hurd Glass Refrigerator Trap.

The Hurd Refrigerator Company, Duluth, Minn., are using the trap shown herewith in their refrigerators to prevent outside air and odors from getting into the refrigerator. The points of excellence claimed for the trap are as follows: It cannot rust and consequently cannot leak; being transparent



The Hurd Glass Refrigerator Trap.

the sediment can be seen and removed before the trap becomes clogged, and being of glass the dirt and filth from the ice will not cling to it as to metal, rendering it easy to keep it clean and sweet.

Improved Firm Joint Calipers.

The accompanying cuts represent firm joint calipers, which are being manufactured by L. S. Starrett, Athol, Mass. The improvement in the calipers is described as consisting in the construction of the joint, which is so made as to be drawn together by means of a screw forcing a washer on to a

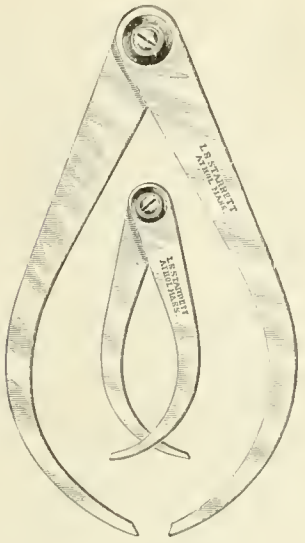


Fig. 1.—Improved Firm Joint Calipers No. 26.

squared end of the main rivet which extends through the legs, thus clamping them together between bearinga so shaped as to insure a smooth and uniform friction, of more or less tension,

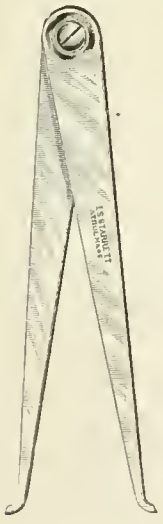


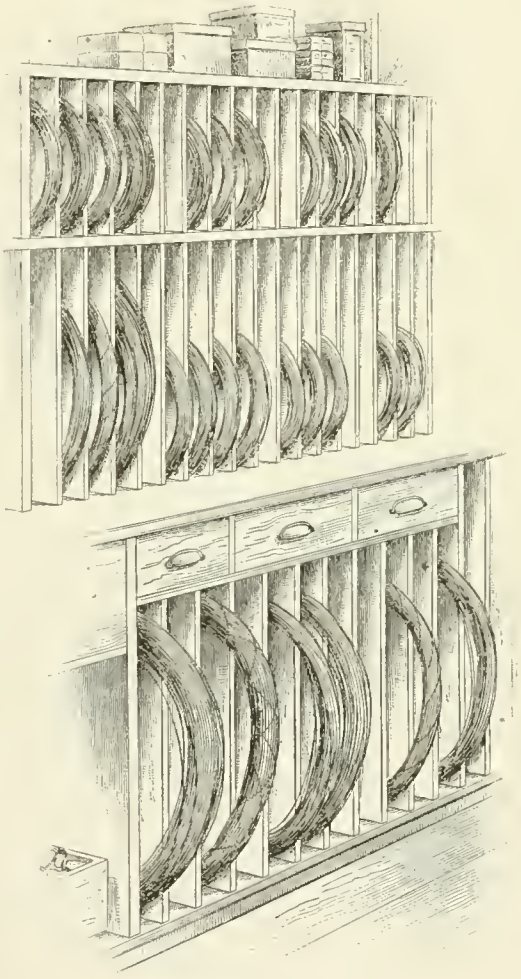
Fig. 2.—Improved Firm Joint Calipers No. 27.

to suit the user. The quality of these calipers is referred to as superior to that of old style riveted joint calipers.

KEEN & HAGERTY, Baltimore, Md., have lately brought out an interesting little novelty which they have named the Jewel tooth and nail brush holder. It is made of sheet metal, with lithographed ornamentation, finished neatly in japan. It will hold any size of brush, and each opening is numbered, which, it is pointed out, prevents the danger of getting the wrong brush. Furthermore, by the holes the brushes are kept aeparate.

A Retail Wire Rack.

S. O. Burnett, 288 Fulton street, Brooklyn, N. Y., has in use a convenient method of keeping Wire from which to retail. The accompanying cut represents a portion of a rack used for this purpose and located at the back end of the store, being a continuation of the shelving on one side. It consists of three sets of bins of various hights and widths, and three drawers. All openings are marked on the partition boards with the size of the Wire each opening is designed to contain. On the top row there are 35 bins, each 12 inches high and 3 inches wide, containing copper



A Retail Wire Rack.

Wire from 16 to 23 gauge; annealed iron Wire from 18 to 24; tinned iron Wire from 18 to 21 and brass Wire from 20 to 22 gauge.

The second row from the top contains the same number of bins as the row above, of the same width, but 20 inches high. In these copper Wire is kept from 2 to 12 gauge and brass Wire from 1 to 19 gauge. The lower bins are each 4½ x 32 inches in size, except where the drawers reduce the hight 5 inches. In these 23 bins tinned and coppered Wire is kept from 9 to 11 gauge, and black iron Wire from 1 to 16 gauge. The drawers are used for iron and copper Wire on spools, also for short remnants of Wire that have been cut from the coils.

Cashing Checks.

Manufacturers and jobbers who give checks and drafts to their traveling men for expenses, writes an interior merchant, often place the wholesaler or retailer upon whom they call in an embarrassing place. To refuse to cash these checks seems very churlish or suspicious, yet men who put faith in them are frequently made to pay dearly for this. Often times the traveling man is making his first trip. He asks you to cash a check of Smith & Jones, payable to the order of Wm. Brown. You are compelled to take his word for it that he is the Wm. Brown, and if he is not you must staud the loss. You dislike to refuse his request; at the same time you know that there is some risk connected with cashing the check, and whatever decision you come to you are sorry for. The trade ought not to be placed in this quandary. Notice could be sent to special points direct from the house, and copy of the signature of the agent given. The house so written to could then pay the check with confidence.

MEMORANDA.

DUDFIELD BROS. have bought out A. F. Staples & Son, at Lathrop, Mo., and will do a stove, tin, hardware, plumbing and heating business.

WITH the very appropriate title "Cold Facts," the Grand Rapids Refrigerator Company of Grand Rapids, Mich., issue a unique publication containing a great deal of interesting matter on the subject of refrigeration. It is a 24-page pamphlet, pocket size, with a neat cover. The theme is naturally the Leonard Cleanable refrigerator. The special features of this style of construction are treated in an admirable manner, with numerous illustrations and lucid descriptions. They are brought out so effectively that the little book must prove a very competent salesman for this line of goods. Small but very handsome cuts are given of the different styles of refrigerators made by the company.

STOVE TRADE NOTES.

Cupola Management.*—III.

BY DR. EDWARD KIRK.

Spout.

The old way of making a cupola spout is to place a short piece of pig iron on the bottom plate on each side of the front, and build up a spout between them with clay or loam. The modern spouts are made of cast iron with a flat or eight-square bottom, and are from 4 to 6 inches deep, 7 to 10 inches wide and 1 to 10 feet long. They are given a fall from the cupola of about 1 inch to the lineal foot, and are lined with a refractory material to protect them from the molten iron. The spout lining is made of a different material from the sand bottom, and generally consists of molding sand, loam or a mixture of fire clay and sharp sand. Some of the molding sands make an excellent spout lining that is not cut or fused by the stream of molten iron, while others crumble and break up too readily when cleaning the spout of dross and dirt, and cannot be used for this purpose. When a molding sand can be used it makes a nice clean spout that is easily and quickly made up. It is readily dried, and when making up the spout the crust of the old lining can be removed with a bar, and the sand wet up and used over with a coating of sand without removing it from the spout. For long spouts, requiring a good deal of material to line them, molding sand is the most economical lining that can be used.

Some of the loam and blue clays make excellent spout linings alone or when mixed with sand, and are the only materials used for this purpose in some sections of the country where they can be produced at a moderate cost. They make a stronger lining than molding sand—that is, not so liable to be broken up when cleaning the spout of dross and slag—and, furthermore, they dry quickly. The lining material probably more extensively used than any other is a mixture of fire clay and sharp sand. These two refractory substances when combined in right proportions and thoroughly mixed make one of the very best spout linings. But when not properly mixed they make one of the poorest linings.

When too much clay is used the lining does not give up the water of combination until heated to a very high heat, and it is almost impossible to get the lining dry so the iron will not boil in the spout the first few taps when the spout is long, or sputter and fly when it is short. It cracks when dried rapidly and is melted into a tough slag that bungs up the spout and cannot be removed without destroying the lining. When too much sand is used the lining crumbles when touched with the bar and is cut and melted by the stream. When the clay and sand are not thoroughly mixed the lining crumbles and cuts or melts in spots. A spout lining made of these two materials in right proportions, properly mixed and dried, becomes as refractory as a fire brick and 50 or 100 tons of iron may be run from a spout lined with them without a break in the lining. There are a number of other materials used for spout linings that are only found in certain localities and their use is restricted to the districts where they can be procured at a moderate cost. But those above described are the materials most commonly used for this purpose.

The spout lining is made up new every heat, and when putting it in the spout is wet to make it adhere to it. The sand bottom is cut away from the front and the spout lining made to extend into the cupola past the tap hole. A perfect joint is made between the sand bottom and spout lining, and a little clay wash is generally brushed over the joint to make it more perfect and prevent cutting. Care must be taken to not get the bottom of the spout at the tap hole higher than the sand bottom, and also to give it the same pitch as the sand bottom. The bottom is put in first and is made about 1-inch thick when the spout has been given the proper pitch. If the spout has not been given a proper pitch the lining is made heavier at the end next the cupola and light at the outer end and the pitch given in the lining. This is the common practice in short spouts.

The sides of the lining are built up full at the bottom so as to leave only a narrow groove in the middle and keep the stream always in one place, but are sloped back from the middle to the top of the spout to give a broad spout surface for carrying the stream of iron. A half round groove 1 inch deep and 2 inches wide at the top is sufficient to carry off the stream of iron from almost any cupola. But the spout is liable to be choked up by dirt from the tap hole or slag and it is made large for safety. A rammer is seldom used in making up a spout and it is generally made up with the hands and one of the bod sticks, or the small round stick used to make the tap hole.

When molding sand is used it is worked a little wetter than for molding and is beaten down with the bod stick and shaped up with the hands and bod stick. When clay or a mixture of clay and sand are used it is worked wet and placed in the spout in balls and beaten or pressed into shape with the hands, and the bod stick is used to true it up and form the groove in the middle. Short spouts are made up with but little difficulty, but great care must be taken in making up a long spout to have it perfectly true and properly pitched so that it will clean itself of molten iron the moment the cupola is stopped in.

The greatest strain upon the spout lining is under and around the tap hole where it is liable to be cut away by the pressure and current of the stream or to be melted if the material is not very refractory, and it may be broken up by the tap bar if not very tenacious when heated to a high temperature. When molding sand or other materials that do not stand a high temperature well or are not very tenacious when heated are used, a layer of fire clay and sharp sand is placed over the lining material under the tap hole. When the heat is very heavy and a large amount of iron is drawn from one tap hole a split fire brick is embedded under the tap hole to prevent cutting and insure a good tap hole throughout the heat. The spout is seldom coated or painted with blacking after it is made up or dried, but when a friable material is used for lining it is sometimes coated with clay wash.

If the spout is made with a broad, flat bottom the stream takes a new course every time the cupola is tapped, and before the heat is over the spout is so bunged up that the iron collects in pools. A continuous stream cannot, therefore, be maintained the length of the spout and two or more streams may fall from the end of the spout at the same time. To prevent this shape the lining to form a small groove for the stream in the center and keep it there every tap. The quality of the lining material has a great deal to do with the condition of a spout during the running off of a heat. The spout may be cut out in holes by the stream and pools of iron form in the spout at every tap. This is due to the lining material crumbling and being washed away by the stream. When this does not occur every heat with the same material it is due to the material not being properly mixed, but if it does occur every heat it is due to poor material. The spout may become choked or bunged up with slag when no slag flows from the tap hole with the iron. This is due to the lining melting and forming a slag. It is very difficult to keep a spout in order through a long heat when this occurs, and the lining material should at once be changed. Slag should be removed from the spout when very hot by lifting it up with a bar or chipped away with a sharp bar when quite cold. All attempts to remove a tough semi fluid slag breaks up and destroys the lining.

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ODD PLATES.

THE UNION STOVE WORKS of 70 Beekman street, New York City, resumed operations at their foundry in Peekskill, N. Y., on Thursday, February 1, giving employment to some 200 hands. The company are able to report a fair spring business, to which the wintry weather experienced at intervals during the past few weeks has given a stimulus.

THE NORTH MILWAUKEE MFG. COMPANY of Milwaukee, Wis., have recently been incorporated, with a capital stock of $250,000. Among the goods to be manufactured are mentioned stoves and ranges. The incorporators are S. A. Drake, G. A. West and A. D. Agnew.

THE A. J. LINDEMANN & HOVERSON COMPANY of Milwaukee, Wis., have issued an illustrated price-list of gasoline stoves, ovens and sheet metal goods which they are offering the trade. The stoves are made under the names Anchor and Star, and include high and low juniors, single generator, individual burner and process stoves. In connec-

tion with the illustrations are given various particulars concerning the goods, together with prices of the various sizes of stoves made. The catalogue also shows single and double valve burners, torches, ovens, elbows, dripping pans, &c.

THE MICHIGAN STOVE COMPANY of Detroit, Mich., are now employing more than 1000 men on part time, the object being to give work to as many hands as possible, even though the orders do not warrant running full capacity. The majority of the men have found employment three days in the week, and for some of the time the shops have been kept running even longer, but last week the plant started on five days' time, which will be the rule until it is possible to operate full capacity. When asked by the representative of a local paper about the business of the company, George H. Barbour is reported to have said: "We have not the assurance of specially heavy business this year, and it is possible that after the spring has reached us we will have to go a little slow, as we may have a light summer trade. Of course we might wait until the season opens and the times are better, but we have decided that we will have to make stoves in some number, if ever so small, and my idea is and has been that we owe it to the unfortunate men around us to give them a chance to work at this time when it is so hard to live, and when work is the greatest charity that can be offered. If a man is able to earn $12 when the season is good and the shops are running full time, he can earn $6 by working half time, and this will go a long way toward the support of his family. When it is possible to run the shops five days in the week the men then only lose one-sixth of their wages, and they can get through the winter all right and do not have to call for help from any one."

AT THE ANNUAL MEETING of the stockholders of the Grander Stove Company, Royersford, Pa., the reports presented showed a very satisfactory volume of business to have been transacted during the past year. A large number of stockholders were present, among the number being George Holt, T. T. Rockett and Wesley Rockett of Philadelphia, Lewis Dauth of Reading, Adam Grander, John Flint, John N. Iselt, W. S. Price, Washington Smith, J. M. Lewin, Wells Taylor, Willis Lewin, Benjamin Carver, S. B. Latshaw and Farney McKee. The directors elected were John Flint, Adam Grander, W. S Price, Washington Smith and John N. Isett. In accordance with their usual custom the stockholders held their annual dinner at Schultze's *café*.

THE WILLIAMS STOVE LINING WORKS of Taunton, Mass., resumed operations on Thursday, February 1, after a brief shut down for the purpose of taking account of stock.

THE STOCKHOLDERS of the Yeager & Hunter Stove Mfg. Company of Spring City, Pa., recently held their annual meeting, at which the following officers were elected: James G. Yeager, president; F. M. Hunter, vice-president; J. Elwood Yeager, secretary, and J. E. Yeager, treasurer.

THE TRUSTEES of the Fuller & Warren Warming and Ventilating Company of Troy, N. Y., have re-elected the following officers: President, Gurdon G. Wolfe; vice-president and general manager, W. F. Wolfe; secretary, William Henry Warren; treasurer, Joseph Mackey.

THE NEW YORK STOVE WORKS recently resumed operations in the various departments of their plant at Peekskill, N. Y., with nearly 100 workmen, and in a few days expect to be running full capacity.

THE PERRY STOVE COMPANY of Albany, N. Y., resumed operations in the various departments of their works on Monday, February 5, giving employment to a force of 150 hands.

"MANY REASONS WHY the West Shore Range is Superior to All Others," is the title of a little pamphlet of 20 pages which reaches us from the Littlefield Stove Company of Albany, N. Y. Within the colored paper covers the stove is illustrated and described at considerable length, as are also the four inventions on which the company so largely base their claims to superiority. Another feature of the pamphlet is found in the directions for putting up and starting a fire in the West Shore range. The alterations in this construction for 1894 include a new base frame which sets the range 1¼ inches higher, new legs for the low closet, raising it 3 inches higher from the floor, a new kicker for the oven door, and a new and better method of fastening to its place the grate front. The company state by this alteration the entire grate fixtures can be taken from their place and a new set substituted, simply by the use of a screw driver.

THE DIPPO MFG. COMPANY of Chagrin Falls, Ohio, is the name of a concern recently incorporated for the purpose of making what are known as Ferrosteel ranges. The plant which they have erected has a capacity for 100 workmen and the goods turned out are meeting with a gratifying reception at the hands of the trade. The castings are said to be of a fine and even texture, the mixture, so they say, being covered by letters patent already allowed or pending. The fire box of the Ferrosteel range is fitted with any one of four different styles of grates, as may be preferred, the ash pit is capacious and easy of access and every door when open forms a shelf. The lids employed are heavy, while the reservoir is placed nearer the fire than is usually the case and has a capacity tor 30 quarts. In other particulars the range is carefully constructed and all points duly considered. The ornamentation is of a neat and attractive character, and the manufacturers are confident that the stove will grow in popularity as the merits become better known to the trade. G. H. Dippo, the general manager, was for some time the superintendent of the Eclipse Stove Works of Mansfield, Ohio, and brings to his position a wide and varied experience. A. D. Hatfield, secretary and treasurer, is a chemist of ability and has had considerable experience in office management.

CHARLES E. COLEMAN, representing the interests of Eugene Munsell & Co., 218 Water street, New York City, reports a gratifying demand for the company's line of Manhattan stoves, ranges and gasoline goods Mr. Coleman covers New York State, Western Connecticut and Massachusetts in the interest of the stove department, visiting his friends twice during the year. Six months of the time he travels exclusively in the interest of mica and micanite, visiting street railways, electrical manufacturers, hardware jobbers and stove makers in all the large cities of the United States and Canada.

J. D. MARVIN, formerly connected with the Fuller & Warren Company, will this year travel in the interests of the Perry Stove Company, looking after the trade in New York City and the State of Connecticut.

HOPES ARE ENTERTAINED by the foundrymen at Albany, N. Y., that the present stagnation will not long continue and there seems to be a much easier feeling than existed two weeks ago. J. Van Wormer & Sons shut down in the latter part of December and at that time had a large stock on hand. Their traveling salesmen went out on the road January 30 and the result of their canvass will deside largely when the works will resume operations again. Mr. Van Wormer says that pig iron is very low and he thinks there will be no necessity for a cut in wages when the plant resumes operations. The Townsend Furnace works are running full time in both the foundry and machine shop. In the latter not a full quota of men are now employed, but in the foundry every man is getting all the work he can do.

THE WARREN HARDWARE COMPANY, 7 Market street, Warren, Ohio, refer to the Warren Steel range, which they manufacture, as being made of the best quality of cold rolled sheet steel, the flues being lined with asbestos, the fire linings sectional and extra heavy and the oven so bolted and braced that it cannot warp. Five sizes are made for family use and two with double oven and end fire box for hotels, restaurants, &c. In style, finish and mechanical construction the Warren range is referred to as being first-class in every respect.

THE PERRY STOVE COMPANY of Albany, N. Y., announce for the season of 1894 larger and more complete lines of oil, gas and gasoline stoves and furniture than ever before. The goods include, among others, three sizes each of popular, medium and low priced lamp stoves, a new line of three sizes of gas hot plates, embodying special features, and four varieties of the Royal oil stove having three and four 4-inch burners, and three, four and five 5-inch burners. The company also state that they have made an arrangement with the manufacturers of the Dangler gasoline stove for the exclusive agency of their entire line for the territory covering the whole of New England, New York and Florida, together with the greater portion of the States of New Jersey and Pennsylvania. James S. McGee, who has been with the company for 19 years, is manager of the New York branch at 109 Beekman street.

THE H. FRANKE STEEL RANGE COMPANY, Cleveland, Ohio, expect to have their new ranges ready for the trade about March 1. The company claim they will have a number of new features never before found in a steel range, patents on which are pending. The company have had a very successful year, much credit being due M. M. Koch, the manager.

THE ANNUAL MEETING of the stockholders of the Bloomington Stove Company, Bloomington, Ill., was held Monday, January 22, at which William Van Schoick was elected president, John W. Evans, secretary and treasurer, and Howard E. Hayes superintendent. The above, with E. H. Miner and H. H. Chrisman, constitute the Board of Directors. All things considered, the stockholders were well pleased with the volume of business for the year 1893. The company state that their Illinois

salesman, F. M. Bean, is succeeded by M. N. Hagaman, who for the past four years has looked after their interests in the State of Iowa. The latter territory will be covered by T. Henderson of Des Moines. The company send us circulars of a cook stove and line of oak heaters which they have brought out for this year's trade. The cook stove is known as the Central, adapted for coal or wood, and embodies the modern improvements. The heaters are known as the Perfect Oak, offered the trade in four sizes, and the Grand Oak, made in two sizes. We understand it is the intention of the company to shortly add to their assortment some new Todd stoves.

The Peninsular Stove Company of Detroit are said to be well pleased with the present volume of business and also with the outlook for the future. Trade is picking up very well, all things considered, and the prospects appear to be that it will continue to improve. The company have been running their foundry the past 30 days and are busy with spring shipments of cook stoves, ranges and steel goods, and are booking orders on furnaces for future shipment.

The Smith & Anthony Stove Company, 217 Lake street, Chicago, report that their trade in heating furnaces and plumbing goods for January of the present year was larger than for the corresponding month of 1893.

An important announcement comes to us from the Gobeille Pattern Company of Cleveland, Ohio, to the effect that they have completed arrangements whereby they are able to take contracts for "pattern castings and iron patterns, filed, fitted and follow-boarded." The company state in their announcement that they guarantee their castings to be soft and true to patterns, and in case of dissatisfaction they may be returned, the company paying charges both ways. The new department of the business, we understand, will be carried on with the same promptness and attention to details which have characterized their wooden pattern work. Pasted to the notice is a little slip bearing the headline "A Bargain." It states that the company have almost ready for shipment a set of wooden patterns for a cook range, 18 and 20 inch oven. The firm for whom they were made have gone into liquidation and the company will sell the patterns at cost.

George H. Barbour, vice president and general manager of the Michigan Stove Company of Detroit, has been visiting Henry E. Stanbach, resident manager of the company's branch in Buffalo. While in the city he was interviewed by a representative of the Buffalo *Evening Times*, and expressed his opinions as to the measures taken in Detroit looking to the relief of the poor and needy and also upon the condition of general trade. Mr. Barbour considers the depression largely due to a lack of confidence and does not think that the Wilson bill will appreciably affect the stove trade. He considers that the worst of the panic is over and that the time of the year is approaching when factories must open and when people must buy goods, however economical their intentions.

We have received from H. Rendtorff & Co., 16 Lake street, Chicago, specimens of the circulars which they are now distributing to the trade. One is an illustrated folder of gasoline stoves and ranges. The goods treated of in this folder comprise the Ideal cabinet range, which is made in two styles, with or without a step; the Ideal process stove with two or three burners, and with or without a step; Ideal high juniors, with either fixed or lay down tanks and with two or three burners? Ideal low juniors, with fixed or lay-down tanks, and with one to three burners. Another circular presents large cuts of the Ideal cabinet range and the Ideal process stove. A third circular treats of the Royal lamp stove, which is a one burner oil stove, having an extra large reservoir, which is a solid cored casting, with no joints to leak and highly japanned. The firm also handle the Beauty oil stoves and ranges in 13 styles and sizes, the Ideal oil heater, the Ideal gas stoves and ranges and a complete line of refrigerators.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

Richter & Co. of Milwaukee, Wis., were awarded the contract for the heating and ventilating apparatus of the Tenth Ward School for $3850. At 20° below zero the temperature in the building is to be maintained during the test at 70°. By this system 30 cubic feet of fresh air per minute for each pupil is also guaranteed, with a complete change of air in the building every ten minutes.

The Richmond Steam Heating Apparatus was used by Capt. Thomas McManus in the three apartment houses which he erected at Fifth avenue and 115th street, New York.

Among the contracts recently taken for steam heating by the Illinois Heating Company, 88 Lake street, Chicago, can be mentioned the following: Four flat buildings of Corse & Jeffery, Vincennes avenue and Forty-fifth street; two apartment buildings of Ringer Bros., Colorado avenue, near Kedzie avenue. and residence of R. A. McWilliams, Fifty-fourth street, near Ridgewood court

The Kelly & Jones Company, 58–62 North Clinton street, Chicago, are to furnish steam heating plants for the First Regiment Armory building, Michigan avenue and Sixteenth street; the Van Dyke, a high class apartment building and hotel combined, Michigan avenue and Fortieth street, and the Pierpont, an apartment building of unusual size, Barry and Evanston avenues.

J. G. Webber, 244 North Clark street, Chicago, is to do the plumbing, sewerage and gas fitting in the 60-flat building of Dawson Bros., Paulina and Walnut streets.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until February 27 for work, including the plumbing for the United States Post Office building at Fremont, Neb. Drawings and specifications may be obtained from the Supervising Architect, Washington, or from the superintendent at Fremont.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until March 2 for work, including the plumbing of United States Custom House and Post Office building at Tallahassee, Fla. Drawings and specifications may be obtained from the Supervising Architect, Washington, D. C., or from the superindendent at Tallahassee.

The work of putting the steam heating apparatus in the new Post Office building at Atchison, Kan., has been completed, and the work has been inspected by Samuel I. Pope of Chicago, the steam heating contractor.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until March 1, for low pressure return circulation steam heating and ventilating apparatus for the United States Post Office building at Cedar Rapids, Iowa. Drawings and specifications may be obtained from the Supervising Architect, Washington, or from the superintendent at Cedar Rapids.

Thomas P. Aitkins has the contract to do the plumbing of the large building being erected by Hartmann & Goldschmidt on Main street, Manchester, Conn.

Tobin & Addis, Plainfield, N. J., have recently completed a fine job of plumbing in the residence of a railroad official in which they used three Standard baths, three Sanitas water closets and a Sanitas kitchen sink and flushing pot.

J. Barham is remodeling the plumbing of the Grant Cottage, at Long Branch, N. J., for the present owner, using three Sanitas roll rim baths and two Sanitas showers. One bathroom is wainscoted with marble 7 feet high and has a marble floor.

The Exeter Machine Works, Boston, Mass., are in receipt of a very flattering letter from Codding & Taft, Worcester, Mass., respecting the advantages of the Exeter radiators, which they describe as unsurpassed in point of beauty and good circulation. Among recent work Messrs. Codding & Taft have installed these radiators in seven houses and two blocks at Worcester, Mass.; also residences and other buildings in Waltham, Spencer, Colebrook Wilkinsonville, Newton, Auburn, South Framingham and Brockton, Mass.; Marvin, N. H., Providence and Olneyville, R. I.

The School Board of La Salle, Ill., have ordered two Eduction closet ranges, of eight and nine sections, from the Walcott-Hurlbut Company, 175–177 Lake street, Chicago.

M. J. Carboy, 78 Dearborn street, Chicago, has the contract for plumbing and gas fitting in the Van Dyke apartment building, Michigan avenue and fortieth street.

The illustrated catalogue issued by the Meriden Malleable Iron Company, Meriden, Conn., presents engravings of a very extended line of brackets for sinks, tanks, seats, shelves and lavatories, as well as lavatory legs, fixtures, &c. These plumbers' supplies are shown in every degree of elaborateness from the simplest to the most ornamental. In addition to all the illustrations, particulars of prices and sizes are given. After many pages devoted to brackets and legs there are similarly illustrated an extended line of hooks and pins, towel racks, paper holders, cigar rests and lavatories. In a prefatory note to this catalogue the Meriden Malleable Iron Company say that they do all the nickel, silver and gold plating with a process exclusively their own, which enables them to finish these goods to correspond with any fixtures or decorations employed in the artistic furnishing of residences, hotels and public buildings.

TRADE REPORT.

The Iron Market.

The developments during the past week have emphasized the tendency toward improvement. As yet the better feeling is very unevenly distributed and in some branches of the trade sellers smile very skeptically over the sanguine utterances made. Even where the improvement has been most marked it is regarded merely as a flash in the pan by many.

During the week there have been placed orders for about 30,000 tons of Billets in the Pittsburgh market and about 11,000 in the Chicago market. There have also been sales in the East. The low sellers have marked up their prices and belated buyers have been forced to pay $16 @ $16.25, Pittsburgh. The Wire industry has now covered for the next few months and a waiting game may develop. If there is any considerable demand for Soft Steel in the near future prices will hold and may harden. It depends now whether other consumers of Soft Steel will gather in enough business to force them to cover. The usual stories of a short interest are again afloat.

Northern furnaces seem to be doing a little better among the founders, while the markets controlled by the Southern product are dull and weak. The producers of standard Irons have been making a drive at their customers recently. The latter, while contracting for the old brands, seem to believe that they have ample time to talk to the sellers of the newer Irons later on.

Pig Iron.— Reports in the trade in the New York market differ quite widely. Sellers of Southern Irons report a dull market, while agents of standard Northern brands note a better inquiry and report the placing of contracts for delivery up to the middle of the year. In some cases they have succeeded in marketing Iron very close to the furnaces in Northern New York. We quote standard brands $13 @ $13.50 for No. 1; $12.50 @ $13 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $13.50 for No. 1; $11.75 @ $12.50 for No. 2; $11.50 @ $12 for No. 3; $11.50 @ $11.75 for No. 2 Soft, and $12 @ $12.50 for No. 1 Soft.

Philadelphia advices intimate that there is no very decided change in the Pig Iron situation in that market, but such as there is appears to be in sellers' favor. Consumers are more inclined to talk business, and in some cases are taking larger lots, and as a rule without concession in prices. Sellers appear to be gathering courage, and while they do not feel warranted in asking more money, they are not disposed to consider anything that involves concessions. The supply of Iron is still quite liberal, so that it is hardly likely that there will be any material change in prices. Sales are increasing somewhat, but there is no difficulty in placing orders at last week's prices, and until there is a bigger demand, or a smaller supply, it is not likely that prices will improve. General quotations for Philadelphia or near by points are about as follows:

No. 1 Foundry	$13 00 @ $14.00
No. 2 Foundry	12.50 @ 13.25

Local Coke Iron was much more active last week in Chicago than during the previous week. It is known that one large consumer, who has for a long time been very conservative in his purchases, concluded that the time had arrived to stock up and therefore placed contracts covering his wants for the greater part of the year. His prominence in the trade causes his action to have a favorable effect on other buyers of Foundry Irons. The foundry trade shows signs of improvement and quite a number of prominenent foundrymen are of the opinion that from this time forward business in this line is bound to increase. Lake Superior Charcoal continues very quiet. Quotations are given as follows, for cash:

Lake Superior Charcoal	$15.30 @ $15.50
Local Coke Foundry, No. 1	12.50 @ 13.00
Local Coke Foundry, No. 2	12.00 @ 12.50
Local Coke Foundry, No. 3	11.75 @ 12.00
Local Scotch	13.00 @ 13.50
Ohio Strong Softeners No. 1	15.00 @ 15.50
Southern Silvery, No. 1	..... @ 13.75
Southern Silvery, No. 2	..... @ 13.25
Southern Coke, No. 2	11.50 @ 11.65
Southern Coke, No. 3	11.00 @ 11.50
Southern, No. 1, Soft	11.50 @ 11.65
Southern, No. 2, Soft	11.00 @ 11.50
Tennessee Charcoal, No. 1	16.00 @ 16.50
Tennessee Charcoal, No. 2	..... @ 15.00
Alabama Car Wheel	18.00 @ 18.50
Jackson County Silvery	16.00 @ 16.50
Other Ohio Silvery	15.00 @ 15.50

Foundry iron is reported as in slightly better demand in the Pittsburgh district, and $11 is now asked for No. 2, delivered. Quotations are given as follows:

No. 1 Foundry	$11.75 @ $12.00, cash.
No. 2 Foundry	10.75 @ 11.00 "

In Southern Pig Iron markets there has been little more than a jobbing demand from the foundries during the week, mainly in carload lots, which, however, foot up in the aggregate rather more than for any of several past weeks. The market is a weak one for all grades of Southern Iron, with offerings at 25¢ @ 50¢ less ℔ ton in many instances. There seems, however, to be no disposition on the part of buyers to anticipate their wants. It is evident, nevertheless, that many of the weak furnaces which have made low prices are out of the market as sellers now. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$11.50 @ $11.75
Southern Coke, No. 2	10.50 @ 10.75
Southern Coke, No. 3	10.00 @ 10.25
Ohio Soft Stone Coal, No. 1	15.25 @ 15.50
Ohio Soft Stone Coal, No. 2	14.25 @ 14.50
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	17.50 @ 18.00
Hanging Rock Charcoal, No. 2	17.50 @ 17.75
Tennessee Charcoal, No. 1	13.50 @ 14.00
Tennessee Charcoal, No. 2	12.50 @ 13.00
Standard Southern Car Wheel	17.00 @ 17 25
Lake Superior Car Wheel and Malleable	16.50 @ 17 00

Metal Market.

Pig Tin.— Prices for Straits Tin have averaged somewhat lower and the market has remained in somewhat dormant condition. Neither consumers nor jobbers have purchased except in a very perfunctory way. Some sales have been made privately at about 19.85¢, net cash, for prompt and near future delivery. Jobbing parcels went at corresponding prices, or, say, at 20¢ @ 21¼¢ from store, according to size. Those figures fairly reflect market value at this writing and the inside rate is very close to the cost of importation. Dealings in futures are still restrained more or less by the uncertainties surrounding the Wilson tariff measure, and poor condition of general trade also has a certain degree of unfavorable bearing, sentimentally at least. The statistical position is given as follows in the Metal Exchange circular:

Shipments:	January. Tons.	December. Tons.	November. Tons.
Straits to Great Britain	2,050	2,900	1,950
Straits to Continent	1,100	925	750
Straits to United States	430	300	200
Total	3,580	4,125	2,900
Australia to Great Britain	330	450	480
Australia to United States	50	None	100
Total	380	450	580
London to United States	360	180	240
Holland to United States	None	None	None
Total	360	180	240
Consumption—			
London deliveries	1,770	1,480	1,670
Holland deliveries	790	685	1,080
United States, excl. Pacific Coast	900	910	1,600
Total	3,460	3,075	4,350
Stocks—			
London	6,547	5,210	4,750
Holland	2,080	1,555	1,715
United States, excl. Pacific Coast	1,710	1,980	2,470
Total at close of month	10,337	8,745	8,935
Afloat—			
For London	3,671	4,490	3,283
Holland	2,260	2,150	1,560
United States, excl. Pacific Coast	1,190	1,005	745
Total at close of month	7,121	7,645	5,588
Visible Supply—		1894.	1893.
February 1		17,458	16,360
January 1		16,390	14,014
		1893.	1892.
December 1		14,523	15,175

Copper.— Several sales have been made of Lake Superior Ingot at 9⅝¢ for prompt and near future delivery. About 50,000 pounds were involved. There are offers now at 9¾¢ by sales agents of some producers and at a shade less from second hand, but it is claimed that no large amount can be secured under 9⅝¢. Naturally the pronounced weakness in this class of the metal has had a depressing influence upon values of other varieties, forcing Electrolytic down to 9⅛¢ and ordinary casting stock to 9¼¢ where other than ordinary small jobbing parcels may be involved. Business at the lower price involved no important quantities, and the demand has not improved to any marked degree. Jobbers report, nevertheless, that although the demand is commonplace and below expectations, yet sales have been somewhat larger the past week than during the one preceding, while prices remain fairly firm. Small lots of Lake Ingot from store are quoted at 11¢.

Sheet Copper.—Inquiries for Cornice Copper have been rather more numerous, but have not as yet to any extent crystallized into orders. Still, the feeling among the trade is more cheerful, and it is hoped that the coming weeks may bring forth more activity in this respect as the prospects of spring and early summer business open out more clearly.

Pig Lead.—There has been a further advance in prices. Single carload lots of common Western are sold at 3.35¢ and holders are now asking 3.40¢ upward. Only routine business has been done at the advance, however, and the demand is extremely commonplace at the present time, with hardly any interest shown except in moderate quantities for near future delivery, outside of a speculative circle in which a considerable amount of Lead is supposed to be held. The demand from smaller consumers has been of a quite limited character, they confining themselves to purchasing only such quantities as they may need for current use. Prices for small lots are fairly firm at about 3⅛¢ @ 4¢ per pound.

Spelter.—Late good purchases at primal points, along with more or less curtailment of production, have had sufficient force to carry a shade higher and impart greater firmness to the tone of the market. Thus far sales have not been made other than choice brands at above 3.65¢ here or at common point, but sellers are now generally asking 3.70¢ upward, and offer very reservedly. Very few will take orders at that price for delivery prior to April 1.

Tin Plate.—Despite the fact that extraordinarily low prices are quoted for spring and early summer deliveries, the demand for futures has been exceedingly slow and dealings only spasmodic. The amount of stock involved has been also considerably below the average for this season of the year. Spot business has also been disappointing and irregular. This is, at any rate, the experience of the majority of dealers, although some in the trade speak of an improvement both in orders and inquiries over those of the past few weeks. Moreover, a tendency is noted to the consideration of larger quantities in individual transactions. Consumers in general, however, show as yet little or no disposition to anticipate their wants, hoping that prices, which have been dropping for so long, may go yet lower. Prices, while showing no radical change, are weak, and there seems little difficulty in obtaining any kind of Plates at the lowest rates made this winter.

Sheet Iron.—Black Sheets are exceedingly slow of sale, except those suitable for tinning. Stocks of the former are ample to meet all the likely demand. Prices are irregular, depending largely upon circumstances. As a rule, it may be said, they are entirely in purchasers' favor. Galvanized Sheets are in but moderate demand, prices remaining steady.

Chicago Report.

Scrap.—Wrought is still neglected, but there is a fair movement in Cast. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb.
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	7.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—The representatives of the great Eastern mining companies held a meeting here on the 30th ult., and decided to stop all rail shipments from the mines to the West for the remainder of the winter. It was calculated that there was enough Coal now in cars at all important points to last through a good part of February. The ample stocks of the Coal companies on the docks at Chicago, Milwaukee and Duluth will furnish supplies for the Northwest during the rest of the winter. It was thought the Lehigh Valley would join with the rest in these drastic measures to prevent a landslide in prices. Carload lots of 12 net tons or over are nominally quoted as follows, but these rates can be shaded about 50¢.

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

Trade Notes.

SUMMERS BROTHERS & Co., Struthers, Ohio, manufacturers of Box Annealed Sheet Iron and Sheet Steel, are putting down a 22 x 24 inch cold rolling mill and expect to have the same in operation about March 15 next. The Sheet mills of this concern are working right along, but their puddling department is not averaging more than one week in a month.

THE SHARON IRON COMPANY, Limited, Sharon, Pa., are putting in a galvanizing plant and expect to have it in operation about March 1 next.

THE SPECIALTY WOOD WORKING COMPANY of Warren, Ohio, makers of Enameled Handles, Pail Woods and Knobs, report an excellent demand for their goods. The company are three months behind orders, the enameling department being enlarged, and new machinery is being added to the turning department.

THE JOSEPH DIXON CRUCIBLE COMPANY, Jersey City, N. J., issue an intereating little pamphlet entitled "Graphite as a Lubricant," being the second edition of the work. After an introductory note a number of pages are devoted to pointing out the advantages of this lubricant, quotations from eminent authorities being included.

THE PALERMO MICA COMPANY, 27 Peck slip, New York, issue a catalogue particularly addressed to the electrical trade, in which they call attention to their pure N. H. Electrical Mica, made in all sizes, and also present a price-list of selected New Hampshire Mica, as well as their Silver Amber Sheet Mica. Of the latter they announce that they are prepared to furnish a superior quality cut to any desired size.

WALLACE & SONS, Ansonia, Conn., now in the hands of receivers, have made a proposition to the creditors of the concern to pay them 60 per cent. of the fair value of their claims, or they will place the whole business in the hands of the trustees to be run for the benefit of the creditors.

WM. L. WHIPPLE, 47 and 49 Manton avenue, Providence, R. I., has enlarged the plumbing department of his business to meet the requirements of an increasing trade. He was recently awarded the contract for the plumbing and ventilating in nine new houses on Eddy street.

CONDITION OF THE

Hardware Trade.

TRADE continues to improve, which is a natural result of the advance of the season and the necessary preparations for spring business. Manufacturers and merchants are soliciting orders earnestly, and a force of travelers perhaps nearly as large as usual is on the road. The result is a volume of business of fair proportions. Most of the orders for general goods are comparatively small, dealers sorting up carefully and awaiting the setting in of an active demand from their customers before buying with old time liberality. In some lines of goods, notably Wire Nails and Barb Wire, there is an improved tone in prices and an excellent demand. The trade on the whole are taking a much more cheerful view of things than for a long time past.

Advices from Chicago.—The volume of business transacted by Shelf Hardware jobbers is steadily increasing and prospects are regarded as considerably better than they were at the beginning of the year. The demand is, however, still running more largely to staple goods than to straight Hardware. Country merchants realize more strongly that Wire Nails and Barb Wire are a good purchase at the existing prices at this time of the year and do not hesitate to take in good stocks. This has brought about an unusual demand, which swells the value of business now current. The demand for seasonable goods has been met for the time, as the field has been pretty well covered now by the salesmen of the several houses. Orders for straight Hardware are confined to small lots for sorting up and will probably not increase to any considerable extent until the time comes for an actual demand from consumers when the building season opens. Heavy Hardware jobbers report a better volume of trade in Iron and Steel, but no special increase in other departments.

Notes on Prices.

Wire Nails.—There continues to be an excellent demand from both wholesale and retail houses, and as a result the mills are well occupied on orders. While there has been no quotable change in prices, the tone of the market, in sympathy with the advances which have taken place in the raw material, is stronger, a fact which has also the influence of stimulating orders from careful buyers who are watching the market closely. The market is represented by quotations ranging from $1.10 to $1, the latter figure being exceptional and given regularly only on large and attractive orders. The New York market is represented by the quotation of $1.20 on dock, with small lots from store at $1.25 to $1.30.

Advices from Chicago.—The manufacturers of Wire Nails report a continued strong demand from all classes of buyers. The mills are now so well filled with ordersthat the makers are apparently in command of the situation. Jobbers who bought what they thought they needed about two weeks ago are now trying to duplicate their orders or otherwise enlarge them and attempting to secure the old rate, in which they are not meeting with much success. Merchants are ready to buy for April delivery, but manufacturers are disinclined to take orders so far ahead with the advance now going on in Steel Billets and Wire. Manufacturers' quotations are, in the majority of cases, about $1.20, Chicago, and the few who are below this are expected to advance their rates in the next few days. Small lots from stock are selling at $1.20 to $1.25, but these low rates will have to be withdrawn if the heavy demand continues for any length of time.

Cut Nails.—The Cut Nail market continues in substantially the same condition as described in our last report. There is an increase in the volume of business and prices remain steady at former quotations. The Western market is represented by the quotation of $1 to $1.05 at mill. The Eastern Cut Nail manufacturers quote $1.05 for carload lots on dock, New York, and are adhering strictly to their agreement to discontinue quoting Nails at factory and are naming only prices for Nails delivered.

Advices from Chicago.—The Cut Steel Nail trade has not experienced the movement shown in Wire Nails, nd yet there has been a steadily improving demand with some orders of good size placed during the past week. Manufacturers are quoting factory lots on the basis of $1.05, Chicago, on a 60-cent average. Jobbers report only a small local demand, and are quoting from stock at $1.15 to $1.20.

Barb Wire.—As the result of the conferences which have been held by the manufacturers, and the active demand of the past few weeks, the Barb Wire market is in a perceptibly improved condition, and is characterized by a stronger tone. There is not, however, as yet entire uniformity in the quotations made by different manufacturers, some of whom are holding Galvanized Four Point at $2 15, while others have not as yet announced the withdrawal of recent quotations.

Advices from Chicago.—The manufacturers of Barb Wire held a meeting in this city on Monday, at which the situation was thoroughly canvassed and the fact brought out that very heavy orders had been booked by all the factories. Taking into consideration the improvement in the demand and the advance in Billets and Wire Rods, an effort is to be made to advance prices on Galvanized Barb Wire to $2.15 at Pittsburgh and Cleveland, and $2 25, Chicago, as the bottom rate for largest lots. Jobbers report a much better demand from their customers and state that the country merchants are sending their orders in by mail instead of waiting for the salesmen to call for them. Prices for small lots have been inclined to weakness at $2.30, but the change in the attitude of manufacturers will evidently have a strengthening tendency.

Traps.—Oneida Community, Kenwood, N. Y., announce revised discounts on their line of Traps as follows:

	Discount per cent.
Newhouse	50 and 10
Hawley & Norton	75 and 5½
Victor	75 and 10 and 5
All Steel	80
Star	60 and 10

Steel Set Screws, &c.—Under date February 1, Reynolds & Co., New Haven, Conn., issue a new list on Steel Set Screws, which is 25 per cent. higher than the list on Iron Set Screws, instead of 50 per cent. higher as heretofore. Other Steel Screws, such as Square Cap Screws, Hexagon Cap Screws, &c., the price on which has heretofore been 50 per cent. higher than for corresponding Iron Screws, will hereafter be also furnished at 25 per cent. advance. The discount on these goods remains as before, but it is announced that on purchases of Set Screws, Square and Hexagon Head Cap Screws, Milled Studs and Coupling Bolts aggregating $500 during the six months ending July 1 or January 1 a rebate of 5 per cent. will be allowed, and provided such purchases amount to $1000 or upward during the same period a rebate of 10 per cent. will be allowed. It is also stated that dealers' full discounts and privileges will be allowed to any and all Hardware supply houses in good standing irrespective of whether they carry a stock of these goods or not.

Shot.—The price of Shot has again declined, a further reduction being announced by the manufacturers under date of February 5. The marked decline which has occurred within the past few weeks is owing in part to the low prices ruling on lead, but there is also an unusually active competition among the manufacturers. Following are the present prices, terms 30 days, or 2 per cent. discount for cash in ten days from date of invoice:

	Per bag.
Drop Shot, sizes smaller than B, 25 pound bags	$1.20
Drop Shot, sizes smaller than B, 5-pound bags	.35
Drop Shot, B and larger sizes, 25-pound bags	1.45
Drop Shot, B and larger sizes, 5-pound bags	.40
Buck and Chilled Shot, 25 pound bags	1.45
" " " " 5-pound "	.40
Dust Shot, 25-pound bags	2.00
" " 5-pound "	.45

In lots of 2000 pounds and upward taken at one time a discount of 5 cents per bag (25 pounds) will be allowed, together with a special discount of 2½ per cent.

Tacks.—The Atlas Tack Corporation are issuing, under date January 24, a

revised discount sheet on Hardware list goods, and also a revised Shoe Finders' list. The prices thus announced represent the market on this line of goods, other manufacturers making the same prices. The revised discounts on Hardware list goods, "straight weights," are as follows, which are subject to an additional 33⅓ per cent., and 2 per cent. for cash:

Goods, Papered, Dozened and M's.

	Per cent.
American Carpet Tacks, Blued	60
" " Tinned and Coppered	65
Steel Carpet Tacks, Bright and Blued	60
" " Tinned and Coppered	65
Swedes Iron Carpet Tacks, S. S., Blued	65
" " " Tinned	70
" " Lanc., Blued	50
" " " Tinned	55
American Cut Tacks, domestic	55
" " foreign	50
Swedes Iron Tacks, S. S., Blued	55
" " " Tinned	60
" " Lanc., Blued	50
" " " Tinned	55
Swedes Iron Upholsterers' Tacks, S. S	60
" " Lanc	50
Gimp Tacks, S. S., Blued	55
" " Tinned	60
" Lanc., Blued	50
" " Tinned	55
Trimmers' Tacks, Lanc	45
" " S. S	50
Hungarian Nails	50
Common and Patent Brads	50
Leathered Tacks	5
Brush Tacks and Nails, S. S	25
" Lanc	20
Looking Glass Tacks	15
Picture Frame Points	25
Lace Tacks	45
" Tinned	50

Pounds, Pound or Half Pound Papers or Bulk.

	Per cent.
Swedes Iron Tacks, Lanc., Blued	50
" " " Tinned	55
" " S. S., Blued	55
" " " Tinned	60
Gimp Tacks, Lanc., Blued	50
" " Tinned	55
" S. S., Blued	55
" " Tinned	60
Light Basket Tacks	45
Regular "	50
Steel Carpet Tacks, Blued	60
" Tinned or Coppered	65
American Cut " Bulk, domestic	55
" " " foreign	50
Swedes Iron Upholsterers' Tacks, S. S	60
" " Lanc	50
Trunk Tacks, S. S	60
" Lanc	50
Finishing Nails	55
Trunk and Clout Nails, Black	60
" Tinned or Coppered	65
Hungarian Nails	50
Basket "	50
Chair "	50
Cigar Box "	40
American Carpet Tacks, Blued	60
" " Coppered or Tinned	65
Swedes " S. S, Blued	65
" " " Coppered or Tinned	70
" " Lanc., Blued	50
" " " Tinned	55
Railroad and Bill Posters' Tacks, S. S	55
" " " Lanc	50
Leathered Tacks	5

The discounts named above are for Straight weight goods, but an extra 5 per cent. is announced on Star weights, an extra 10 and 5 per cent. on Standard weights, and an extra 10 and 10 per cent. on Special weights. On the back of the discount sheet a schedule of the above weights is given.

Ames' Shovels and Spades.—Under date February 1 Oliver Ames & Sons' Corporation, North Easton, Mass., announce a discount of 20 per cent. on all their goods, except the following:

Reed & Lindsay, list Nos. 548 to 572.
Lee & Hadwin, 838 to 880.
Hadwin Drain and Ditching Spades, Nos. 1004, 1009, 1014, 1019, 1024, 1027 and 1029,

and on these goods they will allow a discount of 27½ per cent. They will also allow an extra discount of 10 per cent. to all parties whose net purchases from them exceed $500 for six months. In addition to the above named discounts they will allow at the close of the season, July 1, 1894, a further discount of 5 per cent. to all parties whose net purchases from them exceed $750 during said term. This extra discount is not to be deducted before the expiration of the six months, and is to be forfeited by all parties who have sold their goods at greater discounts than first named. Freight is prepaid to Boston and New York, and all goods are at risk of purchaser after shipment from factory.

Radiators.—Under date of February 5 the American Radiator Company, Chicago, Ill., issue to the trade a new price-list for 1894. In a circular letter accompanying the list they refer to the reductions that have been made in prices, and add:

"We would call your attention, particularly, to the large reduction in price we have made on low hights, the demand for which has grown to such proportions as to justify large investment in machinery and other special patented devices enabling us to produce them at reduced figures. We trust our many friends and customers will appreciate our policy in making this large and abrupt reduction in the price on these and other goods, and let us take this opportunity to again assure the trade that we can always be relied upon to take the lead in all measures which aim at the expansion and development of the Steam and Hot Water Heating business, by those methods which alone can produce lasting and beneficial results. Were we to sacrifice quality, workmanship and those well known and acknowledged scientific principles of construction in order to reduce selling prices, we feel that we would not only be doing ourselves, but the trade in general, great injury. We have, however, in our regular styles and patterns, always adhered strictly to what we believe to be the proper theories of Radiator construction, and such reductions as we have made in our prices have always been accomplished without making sacrifices to quality or workmanship, or by following a shortsighted policy of advocating certain ideas of construction possessing the single advantage of cheapness in production."

We reprint the new list, which is as follows:

National. Perfection. Ideal.

Steam. Inches high.	Steam. Per square foot Cents.	Water. Inches high.	Water. Per square foot. Cents.
45	21½	45	24½
38	22	38	25
32	24	32	27
26	26	26	29
53	28	23	31
20	30	20	33

Detroit, Ornamental Fluted.

Steam.		Water.	
45	21½	45	24½
38	22	38	25
31	24	31	27
25	26	25	29
20	30	20	33

Peerless.

Steam.		Steam.	
45	20½	23	27
38	21	20	29
32	23	Water.	
26	25	38	24

Detroit, Plain Fluted.

Steam.		Water.	
45	19½	45	22½
38	20	38	23
31	22	31	25
25	24	25	27
20	28	20	31

National Single Column.		*National Four Column.*	
Steam.		Steam or Water.	
38	23	38	22
32	26	32	24
26	28	26	26
23	30	23	28
Water.		20	30
38	26		
26	31		

Perfection Flue.

Steam.		Water.	
38	19	38	22
32	21	32	24
26	23	26	26
23	25	23	28
16 to 14	27	16 to 14	30

Detroit Flue.		*Excelsior.*	
Steam or Water.		With Cast Iron top.	
20	23	Made for Steam	
18	24	Only.	
16	25	38	22
14	26	31	24
13	27	25	28
Add 3 cents per foot for curved.		22	31
		19	34

Dining Room Radiators.

Perfection.....40 per cent. off list.
Detroit.....40 per cent. off list.

Specialties.

Steam.	Cents per section	Water.	Cents per section.
Column	25	Column	40
Curved	25	Curved	40
Corner	15	Corner	30
Window	5	Window	10
Stairway	10	Direct-Indirect	12
Direct-Indirect	12	Perfection Rad'r Tops	6

Added to prices quoted for Direct Radiators.

All the foregoing prices are f.o.b. factory, less carload rate of freight to any railroad point of destination east of the Mississippi River and north of Tennessee or North Carolina.

Indirect Radiators.

Excelsior Steam.

12 square feet per section..$1.60 per section.

Excelsior Water.

12 square feet per section..$1.80 per section.

F.o.b. factory, less freight allowance, as above.

Perfection Pin Indirect, for Steam and Water.

Standard size, 10 square feet, $1.35 per section.
Extra large, 15 square feet, $2.10 per section.
F.o.b. factory, less freight allowance as above.
Terms: 60 days or 2 per cent. discount for cash within ten days.

Glass.—The demand for Glass is slow and prices are unsatisfactory. No changes of importance have taken place in the Glass market since our review of last week, and prices named at that time fairly represent present quotations. The market is weaker rather than stronger than a week ago, jobbers and manufacturers each making

prices to suit the requirements of the case. It is reported that the idea of closing all factories February 10 has been abandoned, and it is understood that at present prices sufficient money can be realized on the Glass manufactured to meet current expenses.

Old Metals.—Business in Old Metals continues extremely dull, except in a few lines of Scrap Iron, for which rather more inquiry is reported. Prices continue low and irregular, the following quotations representing those usually paid by New York dealers for moderate quantities:

Heavy Copper	℔ lb 7¢
Light and Tinned Copper	℔ lb 6¢
Heavy Brass	℔ lb 5¢
Light Brass	℔ lb 4¢
Lead	℔ lb 3¢
Tea Lead	℔ lb 2½¢
Zinc	℔ lb 2¼¢
No. 1 Pewter	℔ lb 15¢
No. 2 Pewter	℔ lb 6¢
Wrought Scrap Iron, ℔ gross ton	$7.00 @ $8.00
Heavy Cast Scrap, ℔ gross ton	7.00 @ 8.00
Stove Plate Scrap, ℔ gross ton	4.00 @ 5.00
Burnt Iron, ℔ gross ton	2.50 @ 3.00

Old Rags, Paper, &c.—The market for these materials gives but little evidence of activity and prices continue weak. Quotations for New York delivery are nominally as follows:

No. 1 White Rags	℔ lb 3¼ @ 3⅛¢
No. 2 White Rags	℔ lb 2¼ @ 2⅛¢
Mixed Rags	℔ lb ¾¢
Blues and 3ds	℔ lb 1 @ 1¼¢
Hard Sized White Shavings	℔ lb 2¼ @ 2⅛¢
No. 1 White Book Shavings	℔ lb 2 @ 2⅛¢
No. 2 White Book Shavings	℔ lb 1 @ 1⅝¢
Light Book Shavings	℔ lb ¾¢
No. 1 Mixed Shavings	℔ lb ¾ @ 1 ¢
No. 2 Mixed Shavings	℔ lb ½ @ ¾¢
No. 1 Printed Books	℔ lb 1 @ 1¼¢
Ordinary Mixed Books	℔ lb ½ @ ¾¢
Newspapers	℔ lb 2-5 @ ½¢
No. 1 Manila Paper	℔ lb 1 @ 1⅛¢
No. 2 Manila Paper	℔ lb ⅝ @ ¾¢
Bogus Paper	℔ lb ½¢
Common Paper	℔ lb ⅜¢
Straw Chips	℔ lb ½¢
Binders' Clippings	℔ lb ½ @ ⅝¢
Jute Butts	℔ lb 1⅞ @ 2 ¢
No. 1 Jute Bagging	℔ lb 1 @ 1¼¢
Mixed Bagging	℔ lb ¾ @ 1 ¢
No. 2 Bagging	℔ lb ½ @ ¾¢
Hemp Twine	℔ lb 2 @ 2¼¢
Manila Rope	℔ lb 2¼ @ 2⅜¢
Jute Rope	℔ lb 1½ @ 1¾¢
Mixed Rope	℔ lb ¾ @ ⅞¢

Old Rubber.—The market for this material remains very quiet. New York dealers' prices are nominally as follows:

Car Springs, ton lots, ℔ lb.	@ $0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@ .03
Rubber shoes, less than carloads, ℔ lb.	0.02¼ @ .03⅛
Large Hose, ℔ ton	@ 9.00
White Wringer Rolls, ℔ lb.	@ .04¼
White Syringes, ℔ lb.	@ .05

An important sale of a block of property on lower Broadway, New York, is reputed to have been arranged, the purchasers being certain Chicago capitalists, whose intention, it is said, is to erect there an immense 18 or 20-story office building. The purchase money mentioned is $2,700,000.

The police of New York have been engaged in compiling an accurate census of the unemployed labor in this city. The results of their investigations, which have not yet been promulgated, will be particularly interesting if the report discriminates between *bona fide* workmen out of employment and the chronic idlers.

Corrugated Iron in 1893.

As an illustration of the effect on one of the important branches of the iron industry of the money stringency and the tariff discussion during the summer and fall, and also as showing the decline of trade generally during the year, we are permitted to present the following synopsis of the year's business of one of the prominent manufacturers of corrugated iron and iron and steel roofing:

We compare business of one year with previous years in three ways. 1. Amount in dollars and cents. 2. Amount of tonnage sold. 3. Number of squares sold. Sales for 1893, as compared with 1892, show loss as follows:

	Per cent.
Loss in dollars and cents	27
Loss in tonnage sold	28
Loss in squares sold	24

For the five months of 1893 ending May 31, as compared with the same period in 1892, the gain in dollars and cents was 49½ per cent.

Our first loss in sales for 1893, as compared with 1892, was shown September 30, when the loss was 2½ per cent.

October, November and December of 1893, as compared with the same months in 1892, tell a very instructive story and show the bottom knocked completely out. The results are shown below:

	Dollars. Per cent.	Tonnage. Per cent.	Squares. Per cent.
Loss in October	58	58	54
Loss in November	80	79	74
Loss in December	86½	80	80

The average loss in the three months, as compared with 1892, being in round numbers as follows:

	Per cent.
Dollars	74
Tonnage	72
Squares	69

This large loss in business was not caused by our being afraid to do business, but simply from the fact that business in our line seemed to be practically suspended.

The annual report of the Chicago Board of Trade shows that the business of the board in 1893, although less than that of 1892, was greater than in any other year. Receipts of grain and flour in bushels were 247,000,000, only 8,000,000 bushels less than in 1892. The shipments for actual consumption and for export last year were more than 100,000,000 bushels of grain, 4,100,000 barrels of flour, 956,000,000 pounds of pork product and 1,257,000,000 pounds of beef and beef product, aggregating a value of not less than $250,000,000, making Chicago the greatest provision mart of the world.

Reports from Grand Rapids, Mich., intimate that the furniture manufacturing industry of that district is quite flourishing in spite of the general depression. All the factories are running on either full or part time and have orders enough to keep them busy until July.

The Senate Committee on Agriculture have favorably reported on a bill appropriating $1,000,000 for the extermination of the Russian thistle. This prolific weed has become a serious pest in portions of the country, particularly in the Northwest, where large tracts of land have been overrun by it and rendered useless for agricultural purposes.

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Metal and Miscellaneous Prices.

CHICAGO, FEBRUARY 8, 1894.

Tin—

Straits pigs.....2½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100℔	.5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	.11.30 @11.50
X, 10x14, 14 x 20	@ 7.25
S.V. Grade. IC,10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Fansel and Dean Grades.—	
IC. 14 x 20	...@ $5.62½
20 x 28	.....@ 11.25
IX. 20 x 28	.....@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	.. 6.12½@ .....
IC, 20 x 28	..12.25 @ .....
IX, 14 x 20	.. 7.62½@ .....
20 x 28	..15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00
Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20	..$6.75
IX, 10 x 14, 12 x 12, 14 x 20	.. 8.50
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20	..$7.00
IX, 10 x 14, 12 x 12, 14 x 20	.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal ,extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.50
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	.@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Ironclade A :	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland :	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood :	
IC, 20 x 28	$12.00
Juno :	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method :	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie :	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	5.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 6-10¢	$ 2-10¢
17 to 20	℔ 2 7-10¢	$ 3-10¢
21 to 24	℔ 2 8-10¢	$ 4-10¢
25 and 26	℔ 2 9-10¢	$ 5-10¢
27	℔ 3¢	$ 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....12¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality..dis.70&7½@10%

Copper—

Ingot.

Lake.....11½¢ @ 12¢
Casting Brands.....10½¢ @ 11½¢

Sheet and Bolt.

Discount, 30%.

Copper Bottoms.

Discount, 30%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass	

40 & 45 % @

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....4¾¢
300 ℔ casks.....5 ¢
Loose sheets.....5¼¢

Lead—

Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12½¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	60%
1¼ and under, Galv	52½%
1½ and over, Plain	70%
1½ and over, Galv	60%
Boiler Tubes, list Oct. 24, 1892	70%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	50%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.35 square
Merchant & Co.'s Spanish Tiles :	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1½¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6½¢
" Ground in oil, Red	℔ D, 6½¢
" Ground in oil, Brown	℔ D, 5½¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in oils	52¢
Linseed Oil, Raw, in bbls	49¢
Mineral Paints	2@4¢
Orange Mineral	9½¢
Pure White Lead in Oil	.6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cane, 8½¢ ; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	.84¢
Spirits Turpentine, in bbls., ℔ gal	.35½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.60

NEW YORK, FEBRUARY 9, 1894

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal (guaranteed over 94% pure Aluminum), in ton lots.....℔ D, $0.60

No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ D .65

Lots less than 1 ton, 10¢ @ 2½¢ ℔ D additional.

Antimony—

Cookson.....℔ D, 10¾¢@11¢
Hallett's.....℔ D, 10¼¢@10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1880.

	Per D.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	48

35@40%

Copper and Bronze Tubing—

3¢ ℔ D more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ D
Over 3½ to 5 inches inclusive.....18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ D
Over 3½ to 5 inches inclusive.....19¢ ℔ D

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished.....net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 Inch.
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2.70	3 ¢
Nos. 17 to 20	℔ D, 2.80	3.10¢
Nos. 21 to 24	℔ D, 2.90	3.20¢
Nos. 25 and 26	℔ D, 3	3.30¢
No. 27	℔ D, 3.10	3.40¢
No. 28	℔ D, 3.15	3.50¢
American B. B	℔ D, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12½¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ D, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70&5%@70 &10%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filler Joints—

Lee's.....33⅓%

Lead—

American Pig	3¾¢@4¢
Bar	4¼¢
Pipe	5¾¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	6½¢, 20%

Old Lead in exchange, 2¾¢ ℔ D.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2¼

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, February 17, 1894.

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Heat and Electricity

It has long been known that electricity can be directly generated by heat through the use of what is called the thermo-electric pile. Descriptions of the construction and operation of these piles abound in works upon electricity, but it has been found in their use for electrical purposes only that they are not economical as compared with dynamos or batteries. A large quantity of heat is wasted, and only a very small portion of it is available for the production of electricity. A great deal of study and inventive talent has been devoted to the improvement of thermo-electric piles, but, so far, they have been of little practical or commercial value. A new lead has been opened, however, by Dr. Paul Giraud in combining a thermo-electric pile with a heating stove or furnace, in which combination the heat ordinarily wasted in the use of this apparatus is utilized for heating purposes. In this improvement a very high economy is said to have been reached in the double function of heating and lighting buildings by one and the same apparatus. One difficulty, however, seems insurmountable. The apparatus can be used economically only in cold weather, and in summer other means of lighting must be used. There are many who have not yet abandoned the belief that the thermo-electric pile is destined at some future time to become an efficient means for the supply of electricity, and that its present defects will be much abated if not wholly removed. Should this expectation ever be realized, combinations of heating and lighting apparatus will come into general use.

Dangers of Exhaust Ventilation.

An important fact to bear in mind in weighing the relative merits of the exhaust and plenum systems of ventilation is the danger under the former system of vitiating the atmosphere of a house by gases and odors drawn from any adjacent source. The atmospheric pressure constantly seeks equilibrium. In ascending to high altitudes the air within the body expands, and in escaping through the skin produces distressing effects. A reversal of this process is met with in coal mining, where disastrous results have followed the exhaust system of ventilation, for by drawing out the air from the mine workings the dangerous fire damp was sucked in from outlying pockets and through every crack and crevice in the coal. A similar effect may occur in a building ventilated by the exhaust system. By reducing the pressure within doors by means of exhaust fans every communication with the outer air becomes an inlet duct. Cracks around the windows and the crevices about the doors are conduits of pure air, but the same cannot be said of the waste pipes and cellar openings. A well trapped system of plumbing would resist the slight inward pressure of an ordinary exhaust ventilating system, but it must be remembered that traps are sometimes sealed little, if at all, and every inward tendency of air would increase the danger of filling the house with that mixture of live germs and foul odors collectively known as sewer gas. In a tight apartment it would be possible to reduce the indoors pressure enough to make the atmosphese bubble rapidly through an ordinary plumber's trap. The greater the natural ventilation in the house the less this danger, but it should always be borne in mind that there is a possibility of the entrance of air from sources that had better be cut off.

Philadelphia Mechanics.

The majority of the mechanics of Philadelphia are in a better condition, financially, to struggle with hard times than those of any other large city in the United States, and probably in the world. This is largely due to the fact that there are thousands of small houses in all parts of the town which can be bought at reasonable prices. A small first payment will obtain the deed, and the other payments and the interest are so adjusted that the annual sum exceeds by a small sum the rent charges. Practically the purchaser is given his own time in which to pay for the home. He can pay a fixed amount yearly, and in addition he can reduce the principal at any time and by any sum he chooses. What is of first importance is that this system provides the incentive to economy. He cannot obtain a home in a city like New York, where he can obtain apartments at any desired rate, but in a building he never dreams of owning, as its value so far exceeds his means. The difference is that between small independent houses and those built on the tenement house plan. Therefore in times like the present the Philadelphia mechanic has some resources, in the shape of real estate paid or partly paid for, which will carry him until trade improves. Having acquired the habit of saving for a particular purpose, he can now reduce his current expenses to a greater degree than if he had never learned how much a dollar was worth.

Articles on Steam Fitting.

In the department of Steam and Hot Water this week we continue the publication of a series of articles, begun some time ago, on the practical work of pipe connection for steam heating jobs. The articles are written in an exceedingly simple way by a practical man, who has had a very extensive experience in steam heating work of all kinds. A valuable feature of the contributions is the illustrations, which show in the plainest way the pipe connections and the method of doing the work. The accompanying text is purposely made brief, so that the reader will not be confused by a needless waste of words. All the explanation necessary, however, to give a thorough comprehension of the subject is presented. The instruction afforded by these articles we consider particularly valuable, for it is of a sort to appeal more especially to the plumbers and others who are taking up the work of steam heating and wish to become thoroughly familiar with all the details, and it is becoming generally recognized that the success of a steam heating plant depends more upon the distribution of the surface and the proper pipe arrangements than it does upon the particular boiler installed in the cellar. These details of work, which are so essential, are often learned only at the end of a costly experience, and any instruction that will tend toward lessening errors of design and construction will be welcome to the trade.

British Board of Trade returns for the year ending December 31, 1893, show a large decline in the foreign trade of Great Britain. The total imports for the year were $1,944,464,112, a decrease of $89,876,122 as compared with those of 1892 and of $145 783,555 as compared with 1891. The value of British exports in 1893 was $1,048,768,381, a falling off of $41.187 874 from those of 1892 and of $137,946,739 from the exports of 1891. The returns for the month of January make a more favorable showing than has been the case for some time past. Imports during the month increased $25,584,000 as compared with the corresponding month last year, and exports increased $624,000, compared with those of January, 1893.

Press Working of Sheet Metals.—I.

BY OBERLIN SMITH.

Introductory.

Of the origin and history of the art of metal work as performed in dies, operated by presses, we know but little. The numberless wonderful and beautiful operations of to day, most of which it must be acknowledged, however, tend rather to cheapening and unifying than to beautifying the articles produced, are merely the results of a long course of evolution, tending constantly to a survival of the fittest methods. Regarding the progress of the art as a whole, it cannot be said that any one age shines out upon the pages of history, or that any one inventor has made himself immortal. Processes identical in principle with many of our modern ones were undoubtedly practiced by that master metallurgist and machinist, Tubal Cain, and by the long line of skilled artificers who have been his disciples and followers adown through all the ages which have gradually created civilization.

This civilization in its modern glory and its far greater glory yet to come may be regarded as almost wholly dependent upon the noble art of metal working in its various branches; for we cannot conceive of the existence of the constructions and instruments of modern engineering and other sciences if we were limited to such primitive materials as wood and stone.

Fundamental Principles.

In choosing the specific subject of this article, differentiating the general theme of metal working by selecting sheet metals, and this again by limiting ourselves to the operations of a particular class of tools, we must not lose sight of certain fundamental principles which underlie the art as a whole; considering the important divisions of casting, forging and finishing, as well as press working, but omitting reference to purely chemical and electrical processes.

It may be well just here to say that the four process defining verbs employed near the end of the last sentence are used in a commercial and technical sense rather than in a scientific one, as they somewhat overlap each other in exact meaning. This is readily seen when we consider that casting, which generally means the running of molten material into a mold by the force of gravity merely, sometimes also means the forcing of the same thereunto by means of a pump, or its equivalent, as in type casting and the Whitworth pressure system of steel casting. From this it is but a step to the drop forging of white hot iron in the dies of the drop press or (in other materials) to the pressing to shape of semi-molten glass, or of cold soap and candy. The differences are chiefly those of the degree of plasticity in the substance treated. We thus find no very distinct line of demarcation between casting and forging, for much of the ordinary blacksmith's work is analogous to drop forging, except that his tools are not as highly specialized, and do not so completely give their own form to the work. Again, we find that finishing (in the sense here used of paring and scraping or abrading the surface of the metal to more accurate shape, as in machine shop processes) is partly included in a blacksmith's work, as in chiseling, filing, &c. Still again, we shall see that press working may, and sometimes does, include all of the processes referred to—*e.g.*, forcing into molds, as in casting; cutting, shearing, punching, smashing, bending, stretching, compressing, &c., as in forging; and paring, &c., as in finishing.

In general, however, it may be said that press work has much more in common with forging than with the other processes in question, and that it bears the same relation to the blacksmith's or the coppersmith's work that printing does to the scrivener's art, or chromo making to oil painting, or a knitting machine to one's grandmother. In any of these cases we have on the one hand a mechanico-reproductive process wherein the brain of the designer has been expended upon specialized tools which will produce predetermined articles, all exactly alike, for the benefit of the millions; in many cases, unfortunately, with but little embodiment of the æsthetic. On the other hand, we have much more expensive products, each made singly as the individual child of the artisan's brain, and each differing in some degree from its brethren. Should the artisan happen to be also an artist, as were the stone cutters of Greece and of mediæval Europe, the gold, bronze and iron workers of old Italy and Spain (but as are not, alas! the most of our metal workers of to-day), then his beauty loving individualism in mechanical work serves as a leaven to leaven the lump of ugliness that tends to crush down all love of the beautiful in this intensely utilitarian age.

Referring again to certain general principles underlying the mechanical working of metals (at any rate, in all the processes mentioned except finishing), we have as one necessary condition a molecular structure which will enable the particles to flow among themselves when the proper force is applied. In the case of casting this occurs at a temperature at which the particular metal in question happens to become a perfect liquid or nearly so. In forging the flow usually takes place at a bright red heat, although sometimes the metal is cooler than this, or even entirely cold—this latter term meaning here (and throughout this treatise) the ordinary temperature of the atmosphere. In press work the metal is sometimes heated, as in forging, but in the great majority of cases it is handled cold.

The other necessary condition, besides a capability of approximately non-elastic flow in the material worked, is the employment of certain tools that will first cause this flow and that will then limit it, so as to produce the predetermined shapes required. In ordinary casting these tools consist of the molds to inclose and limit the shape, together with a proper pouring tube (wherein the sprue or gate is formed) to give "head" or pressure to the metal. In forging, they consist of the surfaces and corners of hammers and anvils, together with horns, swages, fullers and other more specialized tools. In that modification of a forge shop called a rolling mill, the tools in question, of course, consist of the surfaces of the rolls, whether they be cylindrical to produce sheet metal, or grooved in various ways to produce bars. In press working the forcing tools are the press rams, while the limiting and shaping operations are performed by the dies.

Probable Origin of the Press.

Before proceeding to a practical analysis of the press working art as we find it existent to-day, it will be well to recur once more to the historical aspect of the subject, that we may trace its probable beginnings back in the primitive ages of the world's history. The first man who chanced to dig up a little nugget of native gold or copper, or some other man who found a piece of malleable metal in the ashes of his fire as a result of the accidental smelting of certain ore happening therein, may very probably have pounded it out thinner between two stones, and thus have become the first sheet metal manufacturer. If he then cut it in two by lapping it over the sharp edge of a stone and sliding another one down past it, he had invented the first shearing press. If he pushed the end of a sharp stick through it into a hole in a stone underneath he was doing the first punching. If the upper tool was rounded off so as not to cut through, he was making a little cup by the process of forming or stamping. Thus simple are most of the operations that we still perform in sheet metal work. We have improved them only in detail, gradually involving better and better tools, to the end of obtaining more and more accuracy, uniformity and rapidity of production. The transition from a punch or upper die, held in and guided by the hand, to a simple machine wherein the same was guided by being attached to a moving ram, was but a natural one and something that required no great inventive ability.

Definition of Metal Working Press.

A general definition of the word "press," as used for the purposes with which we are concerned in this treatise, might be written as follows: A machine on which a bed or anvil is approached by a ram or hammer, having a reciprocating motion in a line approximately at right angles to said bed, and the said ram being suitably guided in the frame work of the machine that it may always move in the same path. It will thus be seen that the two important members in any ordinary press are the bed and the ram, and that they are only a more highly specialized form of the blacksmith's anvil and hammer or of the still more primitive large stone and small stone used by the predecessors of Tubal-Cain. The general essentials in such a machine are a massive and rigid bed with a flat and true surface upon which to fasten one of the dies; a rigid frame work extending toward and surrounding the ram that it may slide, or sometimes swing, therein with a considerable degree of accuracy; means for taking up lost motion caused by original looseness of fitting or by subsequent wear; and a somewhat massive and rigid ram, carrying proper means for fastening and securely holding the other die. The surface of the ram nearest the bed is usually flat and parallel thereto, although for some shearing work and occasionally for rough punching a ram is allowed to swing in the arc of a circle, usually being itself in such case a part of one arm of its operating lever. In the vast majority of cases, however, a ram is of cylindrical or prismatic form, sliding accurately in true bearings in the frame of the press. These bearings should, if the machine is of correct design, be of great length in proportion to the thickness of the ram, the object of thus maintaining the ram rigidly in its predetermined path of motion.

being to always bring the dies together with the same relation to each other, that they may not be injured and that the work may be uniformly shaped thereby.

The causes which tend to destroy this accuracy of motion are: 1. The springing of the ram itself, when made too slim and when projecting too far out of its bearings. 2. False motions (sidewise) in its bearings, either by their not embracing it tight enough or by their being so short as to magnify by means of the leverage the slight looseness which is necessary in any working bearings. 3. The springing of the frame out of its normal shape at points between its bed and the ram bearings. It may therefore be said, in general, that it is almost impossible to make these parts of a press too clumsy, and that the more metal they contain, within reason and consistently with the space available, the better they are, especially as they want not only the strength to keep them in position, but all the inertia possible to prevent vibration when acted upon by the powerful and often rapidly applied forces necessary to move the ram.

Hereafter in this treatise certain parts shown in the illustrations will be uniformly referred to by the following letters: F for press frame; *b* for the bed thereof, which is usually but not always a part of the same casting; R for ram; P for plunger; L for lower die; U for upper die; U′ for drawing punch or inner upper die; M for matrix; K for knock out; S for stripper; G for gauge; *p* for pressure between ram and bed in the line of ram's axis; *t* for throat, and M for metal or other material to be worked in the dies. The other essential parts pertaining to presses and dies are so numerous that no definite system can be maintained in referring to them. The nomenclature herein used will follow conventional practice as far as is feasible, but in names with a number of synonyms the word which seems the most in accordance with common sense will be selected. A case in point is the ram of a press, which, called by this name, seems to be expressed in a short, crisp manner which almost explains itself (because of its ramming functions) even to a layman. Other names frequently used for this member are slide, slide bar, bar, mandrel, gate, head, plunger, &c. The last named word will be herein used for the inside ram of double action presses, the outside one being called simply a ram.

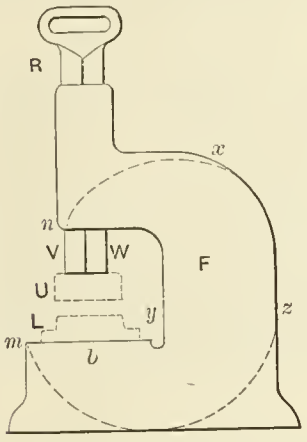


Fig. 1.

Fig. 3.

Fig. 4.

Fig. 9. *Fig.* 10

Fig. 5.

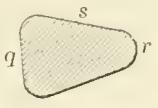


Fig. 6.

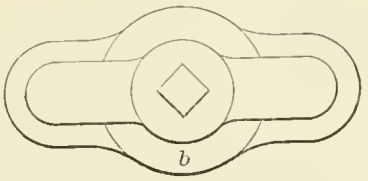


Fig. 8.

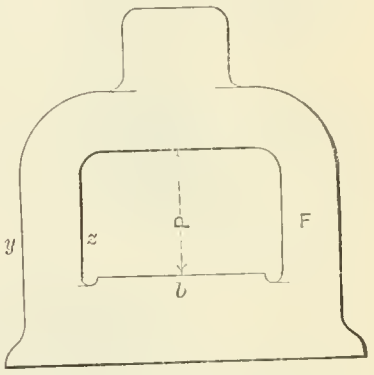


Fig. 7.

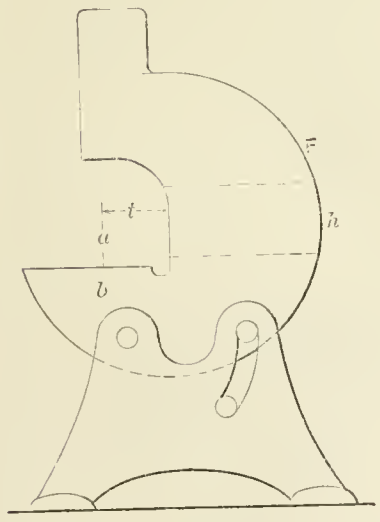


Fig. 11.

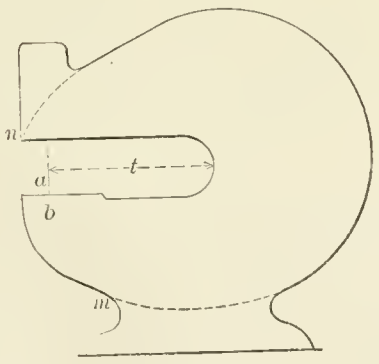


Fig. 13.

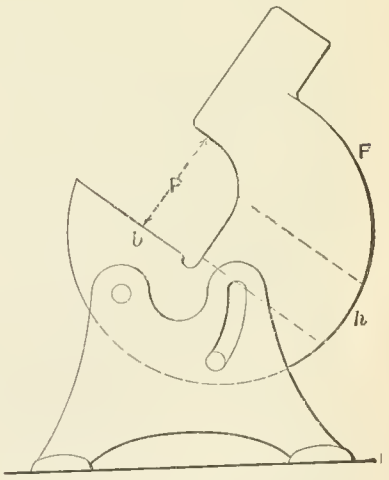


Fig. 12.

PRESS WORKING OF SHEET METALS.

Classification of Presses by Motion.

A strictly logical classification of presses seems impossible, as almost any given kind of press can be grouped by many different systems, some of which will inevitably interfere with and overlap each other. One important general distinction is that between single and double action—that is to say, between those having a plain ram with a simple

uniform motion, and two rams one inside the other, with perhaps different amounts of motion and moving at different times, as is the case with the ordinary drawing press. In some rare cases even more than two rams are used, but machines containing them may be justly ranked with special machinery, and need not be considered here.

Classification by Position.

Another conventional classification is by position. Whether a press is upright, as in Figs. 1 and 11, or inclined, as in Fig. 12, or horizontal, as would be the case if Fig. 1 was fastened with its base against a vertical wall, determined its position and perhaps one of its names. In Figs. 11 and 12 is shown a common form of press where the frame can be set at any desired angle between the two extremes shown by swinging, rocking or otherwise revolving it, in relation to its legs. Such presses are usually called "inclinable," in distinction from the term "inclined," in which latter case the frame is supposed to be permanently fastened in such position. The object of this inclination is that work which is knocked up from the lower die, and delivered between it and the upper die, may slide away from said dies by the force of gravity, usually passing through a hole, *h*, indicated by the dotted lines, and thence descending into a proper receptacle.

Classification by Frame.

Another classification is by the kind of frame used, of which there are many types. The most common among these is the throated frame shown in side view in Figs. 1, 11, 12 and 13, where the throat measurement is counted from the axis *a* of the ram backward to the front surface of the frame, as at the dimension measurement *t*, and is usually expressed in inches Such presses are usually cast with the frame in one piece. The general form is obviously that of a parabolic beam bent somewhat into the shape of the letter C. Such a beam, of course, has its ends of much less depth than its middle portion, according to the well-known laws governing the strength of beams when so constructed as to put equal stress upon the material at all points in their lengths. The ideal outside contour for such a beam is approximately shown by the dotted line in Figs. 1 and 13, which starts at *m* and ends at *n*. The parts of the frame exterior to this line are added at the bottom to give a flat base and at the top to give ram bearings, but the parts necessary for strength lie within said dotted line. In Figs. 3 and 4 are shown cross sections of the back part of the press frame cut at *w x* or at *y z*, where the tensile member *q* is connected with the compressive member *r* by two thin webs at the sides, or one web in the middle, as the case may be. Figs. 3 and 4 are equally good as regards the normal vertical strains of the press, but Fig. 3 has the well-known advantage of any tubular construction in regard to torsional strains, and is, therefore, better for a press frame, as there is less chance of the ram bearings springing sidewise. In both figures the member *q* is shown much heavier than the member *r*, because the usual material, cast iron, is supposed to be employed, and this metal has a tensile strength much less than its compressive. In Fig 5 is shown a cross section sometimes used where there is evidently a considerable waste of material, both in the middle, *s*, and at the back, *r*. In Fig. 6 another section sometimes used is shown. The relation of *q* and *r* is correct, but there is waste material at *s* In some cases press frames of the general C shaped type in question are made with the projecting bed detachable, and perhaps adjustable up and down. Witness an ordinary horn press, where the horn really

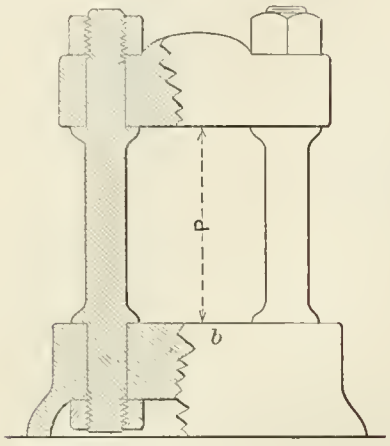


Fig. 14.

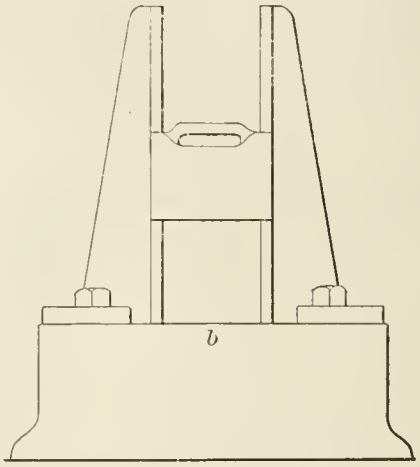


Fig. 22.

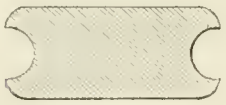


Fig. 20.

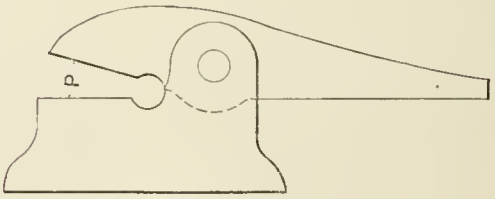


Fig. 23.

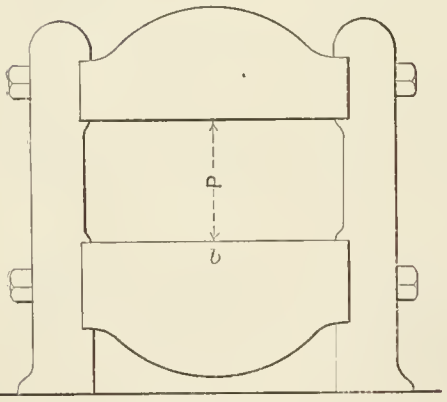


Fig 21.

Fig. 24.

PRESS WORKING OF SHEET METALS.

constitutes the bed, but is interchangeable with other horns.

Perhaps the next most common form of press frame is shown in front view by Fig. 7 and in top view by Fig. 8, where the bed is connected to the ram bearings by two vertical posts or columns, forming a part of the same casting. In these figures a form often used for screw presses is shown, but the same general construction is more often embodied in much taller and narrower presses, which are frequently run by power and used for embossing, punching, &c., particularly in cases where there is no need for passing through a wide sheet of metal, as is done in throated presses. In Fig. 13 is shown a common type of press frame with an exceptionally deep throat, which is used especially for heavy punching and shearing work.

It is evident that in Fig. 7 the frame F consists essentially of a double ended beam forming the bed, connected to another double ended beam across the top by the two upright columns, which are subjected to tensile strains mostly. Any shape of cross section is, therefore, suitable for columns of this kind, the most common forms being those shown in Figs. 9 and 10.

Composite Frames.

Besides the numerous family of seamless press frames there are a variety of composite constructions in which the frame proper is built up of several pieces. Among these a common form, which may be called a pillar press, is shown in partial front section in Fig. 14. In this case a heavy cross beam forming the bed, and usually also the base of the machine, is connected to the cross beam at the top by two or more cylindrical columns or pillars, which are usually turned and accurately fitted to bored holes in the aforementioned beams, being held securely therein by large nuts screwed on at the top and bottom ends thereof. This is a common construction in hydraulic presses, and also in ordinary power presses of very large size. No attempt has been made in the cut to show the ram or its driving mechanism. It will be noticed that the pillars of this press are subjected to tensile stresses only and that it is of a convenient form for cheaply making these members of forged metal, which, of course, makes them much safer against breakage. A design of this kind always strikes the observer as being more architectural in its nature than the forms previously described, as we have here some of the prominent elements of a Greek temple —the stylobate, the columns with base and capital and the entablature being clearly discernible. Its structural principle, however, is evidently very different from the temple in question, the stresses upon whose columns are purely compressive.

Another composite form of press frame is shown in Fig. 21, where the columns are usually of cast metal and where the cross beams forming the bed and what, for want of a better name, we will call the head, are notched into the columns and secured therein by heavy bolts from the outside. The stresses upon these columns are largely tensile, but strongly approach lateral stresses at the points of junction with the cross members.

Still another form of frame is shown in Figs. 22 and 24, where the portraits in front and partial top views, respectively, are of a somewhat corpulent member of the genus drop press, the ram being shown half way up, but without its lifting devices. Such a method of fastening the columns to the bed is sometimes used in other than drop presses, but is not well calculated to resist tensile stresses. This feature is, however, of no importance in the case shown, where the ram falls by gravity and is not pushed downward from any part of the frame as an abutment. This same remark in regard to an upper frame not needing strength, except for ram guiding purposes when gravity actuates the ram, will, of course, also apply to such constructions as Figs. 1 and 7. In Fig. 23 is shown one of the forms of swinging ram previously referred to. In this way are built the well-known lever or alligator shears used in rolling mills, &c. The same principle is obviously employed in ordinary scissors, belt punches and other such tools. In one sense the ram may be said to form the upper arm of the frame. Numerous other frame constructions might be described, but the instances given will cover the majority of those in commercial use.

OBITUARY.

JAMES B. SCOTT.

James B. Scott, one of the most widely known citizens of Pittsburgh and throughout the entire State of Pennsylvania, and senior member of the firm of James B. Scott & Co., tin plate manufacturers, at Pittsburgh, died at his residence in Allegheny City, Pa., on Tuesday, February 13, at 3.30 p. m. The immediate cause of death was diabetes. Previous to the Johnstown flood Mr. Scott had a constitution of iron, but the exposure he underwent at the scene of the disaster, where as dictator he had supreme command of all that was done in dispensing relief and bringing order out of chaos, did much to take the temper out of that splendid constitution, and since that time the deceased had often known what it was to be subject to pains and ailments.

While Mr. Scott was always a successful business man, having amassed quite a large fortune, it was as a public spirited citizen that he was best known. For several years past he has been a member of the State Board of Charities and of the Committee on Lunacy of that board, and in the matter of devoting time and careful, painstaking attention to the important work with which he and his fellow members were charged, he was most generous. It was only last August when Mr. Scott, worn out by the cares of business and being in poor health, having only a few months before been confined to his house for several weeks by a blood trouble, was urged to take a vacation. He took one of three weeks, but spent the entire time traveling through the upper tier of counties, inspecting jails, almshouses and other institutions, county and State, coming within the scope of public charities.

In answer to suggestions that he was devoting too much time to the State, his answer always was that the unfortunate charges of the State received too little attention as it was, and that if it lay in his power to do anything toward relieving their distress or bringing about their reformation he would be amply repaid for all his time and trouble. It was this same spirit that made him among the first to answer the cry of distress from the Valley of the Conemaugh in 1889. He sacrificed his business and his health at that time.

By common consent he was made "Dictator," with all the powers that the term implies, and there he worked with a rare business and executive ability, an indomitable energy and an unselfish charity till a semblance of order had been brought about. It was he who sent back to Pittsburgh an appeal to his business associates that loosened purse strings as they had never been before.

Mr. Scott came home from Johnstown a very sick man. Eventually kidney troubles resulted and would not be shaken off.

Mr. Scott was chairman of the Pittsburgh Relief Committee, formed at the time of the Johnstown flood and was chairman of a like committee at the time of the Oil City and Titusville disaster. For nearly a score of years past he had a leading part in every public undertaking up to the time of the forming of the committee of citizens to arrange for the holding of the next National Encampment Grand Army of the Republic This was last fall and Mr. Scott was urged to take an important office, but much to the regret of all he refused, feeling that his health would not permit of it.

Mr. Scott was one of the vice-presidents of the Chamber of Commerce; a director in the Real Estate Savings Bank; was formerly chairman of the Board of Trustees of the Western University and was prominent in getting the institution established in its present quarters; he was at one time a trustee of the West Penn Hospital and was a vice-president of the Pittsburgh Library Association.

Andrew Carnegie, recognizing Mr. Scott's talents, called him to his aid as chairman of the Carnegie Library Commission of Allegheny, and again as chairman of the commission that has in charge the erection of the Carnegie Library, Music Hall and Art Gallery at Schenley Park.

Mr. Scott was essentially a self-made man. He was born on February 20, 1839, in a house on Third avenue, near Ferry street, Pittsburgh. His father was a contractor. Deceased left the public school he attended to go into the employ of Park, McCurdy & Co., at the same place where Mr. Scott's business house now stands. He continued with the firm till he had purchased an interest, and finally his name appeared at the head of it. He was married in 1867 to Anna W. Jacobus, daughter of Rev. M. W. Jacobus, at that time of the Western Theological Seminary faculty. Five children, a son and four daughters, were born, and all, with the wife, are living.

Two of the daughters were attending school at Farmington, Conn., but reached home late Monday night, just in time to be recognized by their father before he passed into a state of unconsciousness that continued until death claimed him. Until the Wednesday before his death Mr. Scott was attending to his business. His sickness rapidly grew worse and by Sunday there was little doubt that it was his last.

In church work the deceased was as active as in matters of public life and importance. The funeral took place at 2 o'clock Thursday afternoon.

Thomas Sands of Nashua, N. H., is putting on the market galvanizing kettles which are welded instead of being riveted. The body is made of one piece and the rim is strengthened by a heavy steel bar. All danger of breaking is thus avoided.

ROOFING AND CORNICE.

Home Made Wrench for Cornice Makers.

From W. N., *New York City.*—I present herewith for the benefit of the cornice maker and all those who have bolting to do, what we call in the shop a pipe wrench, for fastening the bolts when putting wrought iron braces in cornice work. When fastening bolts in cornice work it is usual to employ a wrench or flat pliers, but as this is very slow work, and the bolts used in cornice work are all of one size, the following diagrams and description will show how to make from a piece of iron pipe square end of the finished pipe, shown in Fig 3. It should be understood that the size of the nut at once gives us the size of the inside diameter of the pipe required. If, for instance, a ½-inch bolt carried a nut of 1 inch square, the size of the pipe should be 1 inch inside diameter. The size of the rod in Fig. 2 tapers from 1 inch to ¼ inch, thus indicating that pipe wrenches from ¼ inch to 1 inch square can be made thereon. If a larger size wrench is required it would only be necessary to use a larger size rod. In Fig. 3 is shown a finished view of a home made wrench. and if so desired the one end, A, can be

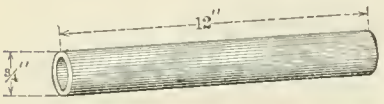


Fig. 1.—Iron Pipe Required.

Fig. 3.—Finished Wrench.

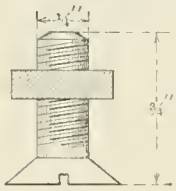


Fig. 4.—Full Size Bolt for Fastening Braces.

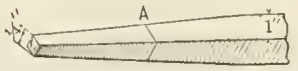


Fig. 2.—Forged Tapering Rod.

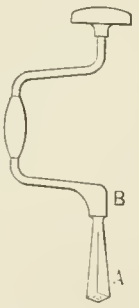


Fig. 6.—Showing How Device Can be Used in a Brace.

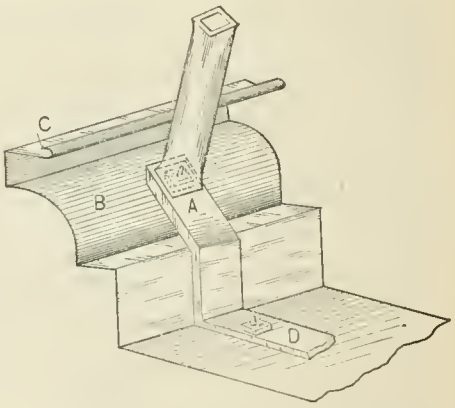


Fig. 5.—Illustrating Method of Using Wrench.

HOME MADE WRENCH FOR CORNICE MAKERS

a home made wrench that is simple and inexpensive, while saving a great amount of time and labor, as proven by actual experience to the writer. Referring to the diagrams, let Fig. 1 represent the piece of gas or steam pipe required, in length about 12 inches or as long as desired, being ½ inch inside diameter and ¾ inch outside diameter, as shown in Fig. 1. Let Fig. 2 represent a forged tapering square rod, forged from a 1-inch square rod, tapering to ¼ inch square, as shown in Fig. 2 In fastening braces in cornice work ½ inch thick bolts are usually employed, and the nuts measure ½ x ½ inch. Then, for making a pipe wrench to fit nuts for ½ inch bolts, proceed as follows: Fasten the square tapering rod, shown in Fig. 2, in a vise, and make a mark on the square rod which will indicate the ½-inch width required for the nut of a ½ inch bolt, as shown at A in Fig. 2. Now heat one or two ends of the pipe to a red heat and pressing the heated pipe over the tapering rod, strike with the hammer alternately until the pipe comes to the ½ inch mark, shown by A in Fig. 2. It may be necessary to heat the pipe a second time. A nut of the bolts which are to be used is now fitted into the made to fit one size nuts and the other end, B, to fit another. But, as, cornice makers use only ½-inch bolts, the full size bolt being shown in Fig. 4, it is better to make the two ends A and B in Fig 3 suitable for this size. B in Fig. 5 represents a piece of cornice with the lock C attached, and the brace A D is shown bolted in position; after the bolts are passed through the brace the nut is turned on the bolt as far as it will go by using the thumb and finger; then, placing the pipe wrench over the nut, as is shown in Fig. 5, and grasping the wrench firmly with two hands, turn the pipe quickly until the nuts are drawn tight. In using an ordinary wrench or pliers a continuous screwing of the nut is not possible when the nuts are in the positions shown by A and D in Fig. 5, but they can be fastened easily with the wrench shown in Fig. 5. Fig 6 shows a carpenters' brace fitted with a pipe wrench forged tapering at A, so as to fit into the socket of the brace, as shown at B. Thus when a number of braces are put into a cornice the nuts are all fastened as far as possible with the fingers; then, using the brace and wrench shown in Fig. 6, the nuts are all tightened at one time.

FLASHINGS.

It is reported that G. B Eggleston has purchased of Mrs. J. K. Klugel the machinery, tools and good will of the Klugel Cornice Works, on Main street, Danville, Ill.

To the Montross Metal Shingle Company, Camden, N. J., we are indebted for an attractive calendar that they distribute to the trade. It is a large card decorated with a view of a residence in Delair, N. J., the second story and roof of which are covered with metal tile shingles made by the Montross Company. The calendar proper is a dozen leaflets attached to the bottom of the card and at the sides of the calendar are engravings of the Gothic tile, Eastlake shingle, Diamond tile and the Octagon shingle.

Proudman Bros., successors to H. B. Todd, Meriden, Conn., have removed from 49 South Second street to 108 Miller street, where they will continue the manufacture of light metal goods, including the Yankee eave trough hangers. under more favorable conditions than heretofore. Their entire plant is now on one floor and much better arranged for economical production.

The S. E. Barrett Mfg. Company, makers of roofing material, will move about May 1 from 68-74 La Salle street, Chicago, to the new Stock Exchange building, Dearborn and Washington streets.

George Camenisch, La Salle, Ill., has purchased the cornice and roofing business of D. C. Harr, the latter keeping the plumbing part of his trade.

J. S. Thorn of 1227 Callowhill street, Philadelphia, galvanized iron and copper cornice and sheet metal work manufacturer, has issued to his

friends a handy little vest pocket "reminder" or calendar especially suitable for business men. Besides ample space for daily memoranda, the book contains some valuable tables and other interesting matter, among which may be mentioned a list of antidotes for poisons and directions for treatment of patients until a doctor can be obtained; also a form of identification of the owner of the book, which, when filled up, completes a record of those measurements and peculiarities which serve as marks of distinction for the ordinary man. The book is nicely bound in a good quality of seal leather and will find a regular place in the pockets of those fortunate enough to receive it.

"From Quarry to Roof: A Practical Illustration of How Roofing Slate is Quarried, Made and Put On," are the headlines of a large poster which reaches us from the Slatington Bangor Slate Syndicate, Slatington, Pa. The poster is of heavy paper, bound at the top and bottom with heavy strips, and arranged with an eye for hanging it upon the wall. It is embellished with numerous illustrations, and descriptive text, calling attention to the varieties of slate turned out by the concern named. One picture represents a quarry pit, another a quarry bank, a third shows slate as split and dressed, another indicates its appearance stacked ready for shipment, while a fifth shows it being loaded on to cars. The central picture represents a dwelling the roof of which is being covered with slate. The seventh picture of the group is that of a blackboard factory. The poster states that while the principal office is in Slatington, Pa, the syndicate is represented in New York, Chicago, Cincinnati, St. Louis, New Orleans, Minneapolis, Omaha and Dallas.

Shop Rules.

We recently received an inquiry from a correspondent who wished information respecting shop rules as adopted by different firms. In response to a request sent to representative shops throughout the country we received a number of examples of the regulations adopted, a selection from which we take pleasure in presenting. In some of the large shops no printed system of regulations is enforced, the men simply being informed what the working hours are, and they are supposed to learn how to conduct themselves if they desire to be continued in the employment of the firm. Where used the regulations are either posted up around the shop or are given to the men as they enter the employ of the firm. As examples of the regulations adopted by some of the prominent shops we present the following:

The Mergenthaler Linotype Company, Brooklyn, N. Y.

REGULATIONS.

All employees of this company will be expected to carefully observe the following regulations, as they are considered a part of the contract with every person in our employ, and non-observance of them will be held sufficient cause for dismissal.

Employees will be furnished with a time check, which will be found on the check board at the entrance to the works, and each employee must deposit his or her check in the time-keeper's box on entering the works both morning and noon. No time will be allowed, under any circumstances, when checks are not so deposited. Checks must not be taken from the building, and no employee will be allowed to deposit any check but his own.

All employees who are not inside the gates within one minute after the last whistle will be considered late and lose one hour's time. This applies both morning and noon.

Employees who make a practice of coming late, either morning or noon, will be dismissed.

The hours of labor will be as given from time to time on the bulletin board at main entrance to the works.

Employees wishing to be absent will notify the foreman of their department, or desiring to leave during working hours, will obtain a pass and give same to the timekeeper at the door before leaving the works. In case of unexpected absence notice must be sent at once stating reason for such absence.

Loafing, frolicking or idling will not be allowed in the works.

Smoking or drinking intoxicating liquors will not be allowed in the works.

Employees will not be allowed to leave the department in which they are employed, except on business, during working hours.

Employees will not be called to the office except in case of necessity, nor allowed to take visitors into the works without permission from the superintendent.

Keep your bench in order and see that tools not in use are in their proper places and all machines clean and oiled.

Should you break a machine or tool report the same at once to your foreman that it may be replaced or repaired.

Employees will be paid every week and will be expected to sign a proper receipt for all moneys received.

The advancement of employees will depend entirely upon attention to business and the interests of the company.

Finally, all will be expected to obey the regulations cheerfully and strictly.

E. W. Bliss Company, Brooklyn, N. Y.

REGULATIONS.

Ten hours' labor shall constitute a day's work—viz., from 7 to 12 a.m. and from 12.30 to 5.30 p.m., except on Saturdays, when the works will close at 4 p.m.

All persons employed will be engaged by the hour. No time less than half an hour will be taken.

The blowing of the whistle will be the signal for closing the doors and the commencement and leaving off of work. No stopping of work or washing up can be allowed before the signal is given.

Hands desiring to be absent will make application to the foreman who supplies them with work, and when unexpectedly detained from work, notice must be sent immediately. Absence from works without permission or notice, as required above, will be considered as indifference to the employers' interest.

The pay roll will be made up every week, ending on Wednesday, and payment will be made the following Friday night.

Hands will not be called to the office except in cases of necessity, nor can they be permitted to take visitors into the works.

Unnecessary conversation, reading, whistling, smoking or frolicking are strictly prohibited in the works during working hours.

Each person employed will see that his bench and tools, and the machines used by him, are kept clean, and when in need of repairs report the same to his foreman. Special care will be expected from all to avoid injuring machines, defacing fixtures, breaking of glass, wasting of files, oil, waste, emery cloth and other stock.

These regulations are considered a part of the contract with every person employed in these works, therefore no one may complain of discharge for non-observance of them.

When industry, energy and economy characterize an employee he will merit and receive the confidence of his employers, and his interest will be advanced as opportunity presents.

Randolph & Clowes, Waterbury, Conn.

REGULATIONS.

1. All persons employed by this company are expected to attend strictly to their business, to observe decorum in language and behavior and stay in the rooms where they are employed; nor will they be allowed to lounge about or visit the other rooms during working hours.

2. All persons employed by this company will be held responsible for all damage that the company may sustain on account of their carelessness or neglect.

3. Ten hours shall constitute a day's work, being from 7 a.m. to 12 m., and from 1 p.m. to 6 p.m.; and all employees must begin and stop work with the whistle. No employee will be allowed to wash or prepare to leave work before the whistle blows.

4. The engine will stop on Saturday night at 5 p.m. from June 1 to September 1, and at 5.30 p.m. from September 1 to June 1, to allow time for cleaning, and every employee will be required to clean up before leaving.

5. Employees desiring to be absent must make application to the foreman of the department where they are employed. When unexpectedly detained from work notice must be sent immediately. Absence from work without permission or notice will be considered indifference to the company's interests and treated accordingly

6. Employees will not be permitted under any circumstances to take visitors into the works.

7. No smoking will be allowed during working hours.

8. No person will be allowed to leave the works during working hours without a permit from his foreman, which permit must be left at the gatehouse.

9. The pay roll will be made up every Monday, and payment in full made every Tuesday, for all work performed up to and including the previous Saturday. Employees must immediately on receipt of pay envelope examine the contents, and should any error occur report the same immediately at the office. Advances will not be made between pay days.

10. The above regulations will be rigidly enforced, and each foreman will be held accountable for the strict enforcement of the same in his department.

The detrimental effects of the coal strike in England are apparent in the yearly returns of British coal exports, which were $10,800,000 less in value last year than those of 1892.

STEAM AND HOT WATER.

Radiator and Drip Connections.

BY HELIOS

Fig. 1 shows the manner of making connections from a riser to radiators where one riser is used to supply two radiators on the same floor, with the radiators on each side of a partition and with the branch connections to radiators taken from the riser at the ceiling below the floor the radiators are placed on. A cross is placed on the riser to receive the branch pipes to the radiator, the pipes being run as shown in Fig. 1. Place ceiling and floor plates as shown.

Fig. 2 shows the manner of making connections from a riser to radiators placed as shown in the illustration. The connections are taken from the riser beneath the floor. Place a cross in the riser and connect the branch pipes to the radiator as shown in Fig. 2. Crosses can only be used in very short risers, as no allowance can be made for the expansion of the piping. If crosses are used where there is considerable expansion in the piping the radiators will lift from the floor, and there is danger of the cross breaking.

Fig. 3 shows the manner of making connection to a radiator from the riser, with the connection from the riser to the radiator above the floor. The tee in the riser is set with the side opening out into the room. Screw into the tee a nipple and on to the nipple an ell, and then screw another nipple into this ell, with an ell on the end. Then screw a nipple into the corner radiator valve and screw the valve into the ell on branch connection. Place the tee in the riser close to the floor, and it will give a good drip back from the radiator to the riser. This connection can be used on any length of riser, as there is allowance for the expansion of the riser.

The same figure also shows return and drip connection taken from the end of the main steam supply pipe. In all steam work the main steam supply pipes must drip from the boiler. For small house work a drip and return pipe can be taken from the end of the main steam pipe, as shown in Fig. 3, and all branch pipes to the radiation on the first floor and all risers can drip back into the steam main. In large buildings it is best to take a drip pipe from the branch pipes to radiators and from the bottom of risers and connect to the main return pipe. Place automatic air valves on end of the steam main, as shown This valve will relieve the steam main of air and allow the air to enter the pipe when there is no steam on.

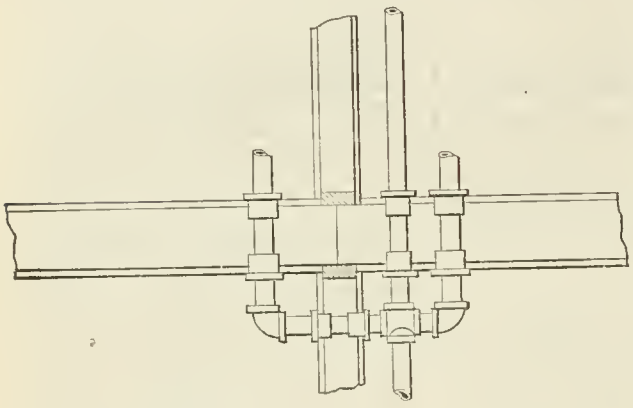


Fig. 1.—Radiator Connections from Ceiling Below.

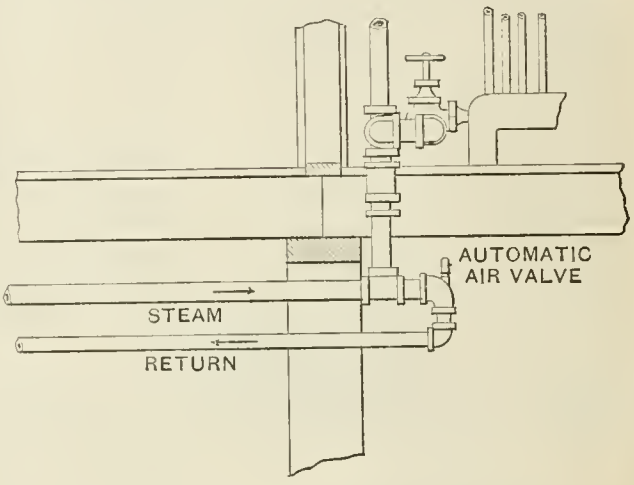


Fig. 3.—Radiator and Drip and Return Connections.

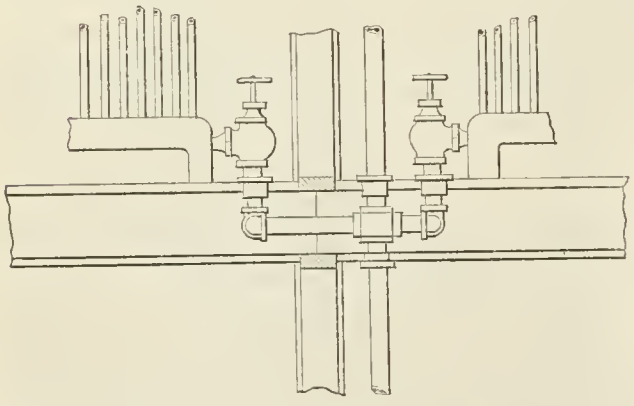


Fig. 2.—Radiator Connections from Beneath Floor.

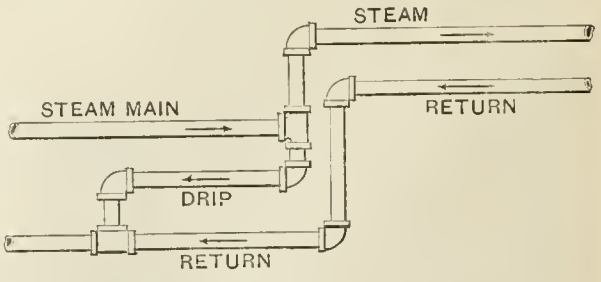


Fig. 4.—Main Steam and Return Drip Connections.

RADIATOR AND DRIP CONNECTIONS.

Fig. 4 shows a drip connection from the main steam pipe to the main return. This connection is used where there is a long line of steam pipe from the boiler. All main steam pipe must drop from the boiler not less than ½ inch in 10 feet, and if the cellar is low a fall of ½ inch in 10 feet will soon bring the steam pipe close to the water line in the boiler. By using this connection, as shown in Fig. 4, the steam main can again be raised to the ceiling and drip to the end. A steam main can be carried any length by making the connection shown in Fig. 4 as often as the steam pipe drops too low. A steam main can be run in this

way 500 feet from the boiler and the end will not be over 6 inches lower than at the boiler. In long lines of pipes do not reduce the size of the pipe, but keep it the same size throughout its entire length.

Warming and Ventilation.*—I.

It is now generally admitted that no system of ventilation is complete that does not provide at the same time for the warming of the incoming air, and that the warming of our public buildings must form part of any ventilation scheme; that, in short, in a well regulated system the ventilation and warming must be included in one scheme. In the following remarks the two will, therefore, always be considered together.

Essentials of any Good Warming and Ventilating Scheme.

A.—AS TO THE INCOMING AIR.

1. It must be fresh and pure.

For this purpose it must be possible to clean it by passing it through a filter or otherwise, and to moisten it, if required.

2. After having entered the building, the air must not be polluted again by being passed along dirty channels or ducts. All ducts, &c., should be constructed in such a manner as to admit of their being easily cleaned and limewashed for disinfecting purposes, if required. The heating surface must be such as to be readily cleaned.

3. It must be admitted into the room in its proper quantities.

4. It must be admitted with great regularity throughout the whole of the year.

5. Its velocity at entry must not be too high, so as to create either drafts or noise.

6. It ought to be made to enter the rooms either near the ceiling or near the floor, according to requirements.

As a general rule the air should enter the rooms near the ceiling and pass out near the floor level; but whenever the air above the heads of the people is considerably impurer than below—for instance, after the lighting of the gas, &c.—part, at any rate, of the air should be taken off at the top of the room.

7. It must be properly diffused, so that in no part of the room can the air remain stagnant. This should be done by properly arranging the inlets and outlets.

8. It should be warmed to the proper temperature and so maintained. This should not require an excessive amount of time in the morning.

9. It should be possible to quickly raise or lower the temperature of a particular room without interfering with any other room, without materially decreasing the volume of air supplied.

10. It should be possible to cool the air in hot weather. Owing to the cost of this process, however, it is not frequently adopted. To lower the temperature of a hall containing 1000 people from 80° to 70° F., with an allowance of 2000 cubic feet per head per hour, requires about 1 ton of ice per hour.

B.—AS TO THE OUTGOING AIR.

11. It should leave the room either near the floor or near the ceiling, according to requirements.

12. It should leave the room in sufficient quantities so as to make room for the fresh air.

13. It should leave the room with great regularity throughout the whole of the year.

14. Its velocity at exit should not be too high, so as to cause either drafts or noise.

15. The vitiated air from one room must not be allowed to enter another room through back or down drafts. The outlets into the outer air must be so arranged that this is impossible.

16. The vitiated air of a room containing fever germs should be sterilized by being passed through a higher temperature, such as the heat of a furnace, &c.

C.—AS TO THE WORKING OF THE SCHEME.

17. The machinery for dealing with the warming and ventilation should be arranged in such a way as to be easily manipulated by the man in charge without undue trouble, and, if possible, without entering the rooms, and he should be responsible for maintaining and controlling the temperature.

18. The arrangements should be fairly simple, so as to be readily understood.

19. The cost of the scheme should not be excessive either in first cost or in annual working expenses.

Ventilation by Natural Means.

Sir Henry Roscoe sums up these advantages in the case of schools as follows:

1. "Because it is more comfortable, the rooms being kept warmer, the temperature being more uniform and more equally distributed, while drafts are as far as possible avoided."

2. "Because it is much healthier and diminishes the risk of the spread of infectious disease, owing to the rooms being supplied with purer air."

3. "Because the children by it are enabled to derive greater benefit from their education."

4. "Because it increases their grant earning power without increasing the labor of earning the grant."

5. "Because it lessons the labor and increases the teaching power of the teacher."

The author would here remark that under the term "ventilation by natural means," "natural ventilation," or "automatic ventilation," he comprises all those methods of ventilation which rely solely on the difference of temperature and the state of the atmosphere as the moving power, and in which no provision is made for increasing the temperature of the outgoing air, so as to create a powerful upcast movement; and under the term of "artifical ventilation by mechanical means," or "mechanical ventilation," he classes all those systems in which either special arrangements have been made to heat the outgoing air, or in which a distinct motive power (steam, gas, electricity, &c.) is employed for driving machinery, which either propels or extracts the air.

Ventilation by Mechanical Means.

The mechanical systems of ventilation now in use may be broadly subdivided into two classes; one in which the extraction of the polluted air courses, by the establishment of a partial vacuum and the inrush of fresh air; the other in which the fresh air enters the room under a slight pressure, thus forcing the foul air before it. The former method is called the "extraction, aspiration or vacuum system," and the latter the "propulsion, impulsion or plenum system." In their practical application these methods are not always kept strictly apart, but frequently a combination of the two is employed, according to the circumstances of the particular case.

As to the value of these systems, it would be altogether wrong to suppose that one special method is or can be applicable to all buildings; and if it were tried to establish one and the same principle in every building one is called upon to ventilate some failures would inevitably result, good as this particular system might be. The author would, therefore, most strongly emphasize this point: that an engineer designing the warming and ventilating arrangements of a building, in order to be successful in his designs, must on no account be bound down to any particular system, but must be allowed to adopt his scheme to the requirements of each building he is entrusted with. A description was then given of the different methods of ventilating on the exhaust plan with a statement that:

The more important points of difference are as follows:

1. As to the purity of the incoming air.—In the vacuum system, it is difficult to say with certainty from which place the fresh air is taken. On the air in the room being extracted a partial vacuum is established, which is filled by air rushing in from all sides, that place supplying most where the resistance to the passage of the air is smallest. If a drain, sewer, soil pipe or water closet happens to be near, polluted air from either of these sources may get drawn in without filtration.

2. As to drafts.—The chances of drafts through the inrush of cold air are considerable in this method.

3. As to the diffusion of the incoming air.—It is difficult to obtain perfect diffusion with this system, as the air entering the room to supply the partial vacuum will frequently rush at once across it to the outlet opening through which the fan is pulling it, leaving the vitiated air unaffected.

4. Extraction tower system with heat.—In any system as employed at the Medway Street Board School, Leicester, the difficulty is to get the extraction flues large enough to extract enough air during the summer months, when the heating of the building is discontinued and the temperature difference inside and outside the tower not large enough to set up a powerful extraction action.

5. Numerous inlets of fresh air supplied with filters.—In any scheme where the fresh air is allowed to enter the building through numerous openings at which it is filtered, the difficulties of properly regulating the air supply are greatly increased, owing to the great number of filters requiring constant attention.

6. Controlling the temperature of the rooms.—In a scheme in which the heating surface is placed in the rooms themselves, the regulation of the temperature must almost of necessity pass out of the hands of the man in charge, which those who have under their supervision know is a distinct failing.

(*To be concluded.*)

* Paper read by Mr. Ashwell before the British Association for the Advancement of Science.

MESSRS. GILLETT AND JUDD, Aurora, Ill., have sold their interest in the plumbing business to Messrs. Johnson and Walters of the Aurora Steam Heating Company, and the firm will now be known as Lake, Johnson & Walters, their place of business being at 36 Fox street.

The Master Fitters' Association.

We are requested by Secretary Reynolds of the Master Steam and Hot Water Fitters' Association of the United States, whose office is at room 625 Metropolitan Life Building, Madison avenue and Twenty-third street, New York, to publish the following announcement:

The Executive Committee of the Master Steam and Hot Water Fitters' Association of the United States have decided to hold their coming annual meeting at the Broadway Central Hotel, on Broadway, near Third street, New York City, on the 19th, 20 h and 21st days of June next. Mr. Tilly Haynes, whose name is so familiar to the public as a successful hotel man, is proprietor of the Broadway Central, and we have his assurance that all will be properly looked after and fairly treated on this occasion. Rates, "American plan," will be from $2.50 to $4 per day, the reduction being that their usual $3 per day accommodations will be at the $2.50 rate; $3 50 at $3; $4 at $3 50 and $5 at $4 per day. On arrival of guests special and satisfactory arrangements can be made on the European plan, if any so desire. The appointments at the Broadway Central are specially favorable to those who may desire to exhibit goods during the convention. Full particulars regarding this feature can be had and arrangements made by addressing the hotel people direct.

Radiator on Boiler Level.

From A. C. Edgar, *Philadelphia.*—In *The Metal Worker* of Feoruary 10, "J. W. H." wrestles with difficulties that are only imaginary. He objects to the sketch recommended in the issue of January 27 because there appears to be no provision made for the pipe expansion. This is a subject that the practical pipe fitter is so well acquainted with that he would not attempt to make connections without allowing for expansion, even though not shown on sketch. He compares the recommended method with the independent main and does not consider it good practice to connect radiators on different levels with the same supply. It may be customary in the city that is truthfully called "the home of modern hot water heating" to run separate mains for radiators on different levels, but it would not be considered good practice here; in fact, would seldom be allowed in a seven or eight story building, where the several mains would be an unnecessary disfigurement to finished apartments in the basement. A trunk main properly reduced where branches are taken off will heat all radiators evenly and at the same time, even when mild firing is required. The plan recommended was not to dispense with syphon and independent mains entirely, but simply a means of obtaining the desired results where either of the former would be inconvenient. The difference in temperature between the upper and lower radiators will be no greater when connected as recommended than it would be if connected with syphon or independent main. Practical application has proven the foregoing to be correct when the supply to upper radiator is large enough. Let the "sharpening process" recommended by "J. W. H." continue.

HEATING NOTES.

Master Steam and Hot Water Fitters' Association of the United States, through their Executive Committee, are issuing an address to the members of the trade throughout the country, calling attention to the advantages that are to be obtained by membership in the association. They inclose blanks for membership applications, and request that communications be sent to Secretary Reynolds, Room 625 Metropolitan Life Building, New York City.

The American House Heater is the name of the hot water apparatus made by the Whitlock Coil Pipe Company, Elmwood, Conn., that has been used recently in a number of New England contracts.

The Hoffman-Russell Company have been formed, with a capital of $25,000, and will conduct a general heating business at 82 Lake street, Chicago, They are agents for the Economy heaters, Brownson improved boilers and the Weston engines. The officers of the company are as follows: Geo. D. Hoffman, president; J. E. Russell, vice-president and manager; B. L. Engelke, secretary and treasurer.

The New York Exhaust & Blow Pipe Company, 26 to 30 Mechanic street, Hartford, Conn., made all of the sheet iron work for the heating plant in the Opera House at Middletown, Conn., and for the exhaust plants in the wood working mills of G. Elias & Bro., Buffalo, N. Y., and the Chas. Parker Company, at Yalesville, Conn. They make a specialty of erecting ventilating plants to be used in connection with fans.

Specially interesting to Western readers is a new publication entitled "A Few Voluntary Testimonials" concerning the operation of Mott's Sunray water heaters, received from various points in the West, and issued by the J. L. Mott Iron Works, 311 and 313 Wabash avenue, Chicago, and 84 to 90 Beekman street, New York. In this work, which comprises 24 pages, are given exact reproductions of commendatory letters received by the firm named from a variety of persons at different points in the West, comprising architects, plumbers, steam fitters and consumers. It is gratifying to read what a man says in his own handwriting, and the burden of these letters must be particularly gratifying to the firm, as they are so warmly eulogistic. In addition to the letters some sectional plates are presented to show the internal construction of the Sunray and tables are given of sizes and dimensions. The work is beautifully printed and is bound in a neat paper cover.

St. Joseph, Mo., will probably be heated by steam from a central supply station. This is to be done by the company operating the electric street car lines under the name of the St. Joseph Traction & Lighting Company. The project has been considered for a long time, but has only recently taken practical shape.

The Windsor Heater Company of Galena, Ill., issue a 24-page catalogue descriptive of their hot water heater. A chapter on the advantages of heating with hot water forms an appropriate introduction to the work. Then follows an elaborate treatise on the Windsor system. This heater is constructed of vertical tubes, which completely surround the combustion chamber and extend to the bottom of it. Cast iron annular water chambers are placed at the bottom and top of the heater, but externally, so that cast iron parts do not come in contact with the fire. The company manufacture their own radiators, which are made of horizontal tubes fitted up in either plain or ornamental finish, and can be made of any hight, length or shape to fit corners or curves. These radiators are constructed of ¼-inch pipe, so as to secure increased radiating surface by the finer subdivision of the water. Ten sizes of heaters are made, of which the odd numbers are adapted to soft coal and the even numbers to hard coal. The table giving dimensions and capacities of these heaters states the approximate cubic feet of space each size is intended to heat, in addition to giving the usual information as to square feet of radiation which it is calculated to carry. The catalogue concludes with a number of testimonials from those who have used the Windsor heater in their dwellings.

B. E Mallory of Norwich, Conn., and Geo. W. Clark of Newark, N. J., were at the plumbers' convention at Hartford, Conn., talking steam and hot water and representing the Richmond Stove Company, Norwich, Conn.

"Exporters' Hand-Book of Mexico" is the title of a 64 page book published by Philip G. Roeder, 664 Cedar avenue, Cleveland, Ohio, and Calle de la Palma No. 2, Mexico City, Mexico. The compiler has spent several years in traveling through the Republic, and the list of towns, with the leading banks, hotels and dealers in all kinds of goods, was made for his own convenience. It gives some Spanish business terms and their English translations, and special stress is laid upon the necessity of carrying out literally and in detail all instructions in reference to packing and shipping goods that are given with order.

The *Journal du Gaz et de l'Electricité* says that to keep flies from injuring picture frames or other articles, it is a good plan to paint them over, with a soft brush, with the liquid obtained by boiling three or four onions in a pint of water. The flies dislike this and will not approach any article so coated.

President C. P. Huntington of the Southern Pacific Railroad has approved the plans and signed a contract with the Phœnixville Bridge Company for the construction of a new bridge for the company's line over the Mississippi near New Orleans The bridge, which will cost $5 000,000, will be 10,500 feet long, with a double track. It will be built on the cantilever principle, and will be one of the largest bridges in existence. The object in its construction is to give the Southern Pacific an all rail entrance into New Orleans.

Cotton seed oil will now be shipped in bulk, like petroleum, on ocean steamships. The pioneer vessel for this new commercial departure was lately launched at Port Glasgow for the American Cottonseed Oil Company. The new ship, named the "Aco," is 345 feet long, 43 feet beam and 22½ feet depth of hold, and is built throughout of steel. She is so designed that she can carry either a liquid or general cargo, or both at the same time. There will be room for 500,000 gallons of oil in her holds besides about 1000 tons of general cargo.

PLUMBING and GAS FITTING.

New York State Plumbers.

The Master Plumbers' Association of the State of New York will hold its annual convention in Buffalo, N. Y., on March 6, 7 and 8 next, with headquarters at the Tifft House. About 200 delegates are expected.

The local association of master plumbers, headed by Charles Geiger of Barnes & Geiger, who is the present president of the State Association, is making extensive arrangements for the entertainment of the visitors during their stay.

The master plumbers will go in a body to the Builders' Exchange on the morning of the 6th, where they will be received by the master builders. Mayor Bishop will deliver an address of welcome, which will be responded to by President Geiger. In the afternoon the regular business sessions of the association will begin at Metropolitan Hall. The Committee on Entertainment has arranged for a carriage drive around the city, a theater party and other amusements. On one of the evenings a reception will be given the delegates at the parlors of the exempt firemen on Pearl street, and possibly a banquet may be added to the programme for one of the evenings.

Domestic Electrical Work.*—XI.

By W. A. W.

Running Wires in Finished Buildings.

To become an expert at running wires in buildings already finished it is necessary to study closely the general construction of buildings. It is very essential to be able to determine beforehand where and what sort of obstructions we are likely to encounter in attempting to wire a building, and perhaps nowhere else has the electrician a better opportunity for the display of skill and ingenuity than in wiring an old house and leaving scarcely a trace of his work behind him. It seems at times a very difficult matter indeed to get a certain wire into a certain place without tearing up floors or disfiguring the wood work of a house, but by the exercise of a little patience and perseverance it can usually be accomplished.

We will begin with an ordinary door bell and let the push button be placed on the door. This is not usually the case, but is sometimes required. It frequently happens that an old fashioned door bell is taken off to make room for an electric bell, but in doing this an ugly looking hole is left in the door, which must be covered up some way, and we naturally look to the electric push button as the most suitable thing to help us out. The neatest way of wiring a door is to bore a ¼-inch hole from the hinge side into the door until it intersects with the hole left by the old bell. With a floor groover cut a groove on the edge from the hole just bored to the lower hinge and another to the upper hinge. It is best to remove the door from its hinges, take off the hinges and file bright on the back side around one of the screw holes. Bare the end of the wire and lay a few turns of it so that it will come in contact with the spot filed bright and around one of the screws. Lay the wires along the grooves on the edge of the door, driving a staple every 5 or 6 inches. Be sure to drive these deep enough so that none will project to interfere with the closing of the door. Run the wires to the push button through the ¼-inch hole previously bored and connect in the usual manner.

Proceed in like manner for the parts of hinges and door frame. Bore ⅝ inch holes from back of these through the door frame until the open space back of the plastering is reached. The drop line, with piece of chain or lead weight attached, should be lowered from the upper hole, and with a piece of wire, with a small hook at the end, enough of the line should be fished through the lower hole to permit another piece of line to be tied to it. To the ends of these lines the wires must be fastened. By driving a wire finishing nail through the floor alongside of door frame we can easily locate the spot from below. From here a ½-inch hole should be bored diagonally through the sill, so that it will come out in the space behind the plastering. Through this hole the drop line, with wires attached, must be fished. The bell, which should be placed against a partition, presents less difficulty in wiring; it is only necessary to bore a hole where the bell is to be located, put in the drop line, drive a nail as before, to locate the place, bore a hole from below and fish it out. This makes a very neat job if properly executed. The hinges of the door acting as a part of the conducting wire leaves the door free to be taken down and also obviates the unsightly slack wire running from door to frame.

Where a job requires a general wiring, such as gas lighting or annunciator work, the building must be well studied before starting out, so as to avoid as much as possible all serious obstructions. The first story of a building seldom presents any serious difficulties in wiring. In a two-story building it is usually found much easier to run a wire from the cellar to the garret, where we are generally permitted to work with hammer and tongs, as there is nothing to disfigure, and it is an easy matter to branch off to the various fixtures and drop down from above. Where it is necessary to run wires between ceiling and floor the circuit, if possible, should be so arranged that these wires will run parallel with the joist. A small hole just large enough to let the drop line through should be bored so as to reach into the partition below. Let the drop line down and fish out in the cellar, attach the wire to this and draw it up. Drop part of the line back into the hole again.

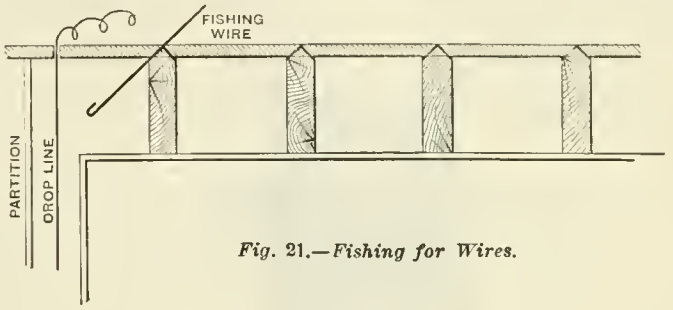


Fig. 21.—Fishing for Wires.

Next bore a hole through the floor in the direction in which the wire is to run and as far from the first hole as can conveniently be reached with a fishing wire and draw the line through here, and so on until the fixture is reached. All holes should afterward be neatly plugged up, giving the plugs a coat of shellac varnish before driving in to prevent them coming out. Where, for fishing purposes, holes are bored through plastered walls that are papered, three sides of a small square

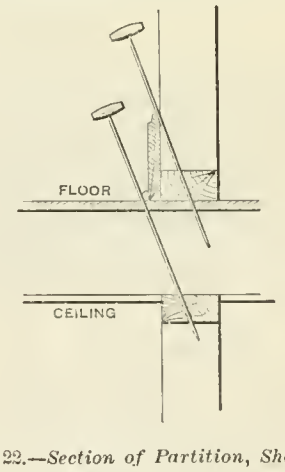


Fig. 22.—Section of Partition, Showing Method of Wiring.

should be cut in the paper and the paper dampened a little so that it can be loosened and turned back. When done the hole should be filled with plaster of paris and the paper pasted back, thus obliterating all traces of the work done.

In lightly built houses it is often found easier to take off the baseboard molding and run the wires under it. Care should be taken, however, to break off all old nails, as any attempt to drive them back would be almost certain to injure the molding.

*Copyrighted, 1893, by David Williams.

When it is necessary to run wires between floor and ceiling crosswise to the joist, the first thing to do is to locate their centers. From the centers bore ¼-inch holes each way in the form of an inverted V, and work from one joist to the next with drop line and fishing wire, as shown in Fig. 21.

In old houses where partitions are directly under each other it is an easy matter sometimes to drop a line from garret to cellar. In the modern house, however, it is not such a simple job, as we usually find a 2 x 4 plate on top of the studding underneath the joist, and another 2 x 4 sill on top of the floor on which the upper partition studding rest. In Fig. 22 is shown a method of passing obstructions of this nature. The obstructions met within a finished building are of such great variety that space will not permit of a description, or even mention of them all. But enough has been shown and described to indicate the general plan adopted for doing this kind of work, and by exercising a little ingenuity no serious difficulty should be experienced in reaching almost any part of a house with a wire. Where wires are run exposed on baseboards, door or window casing they should be drawn taut and well stapled, and last, but not least, never, under any circumstances, run more than one wire under a staple; it is dangerous practice and is sure to cause trouble sooner or later.

[THE END.]

Eureka Smoke Testing Machine.

Eureka Smoke Testing Machine.

A device of interest to the plumbing trade has just been brought out by the Bailey-Farrell Mfg. Company, Pittsburgh, Pa. The machine, which we show in the accompanying illustration, is designed for testing the soil and sewer systems of houses just completed; also for detecting leaks in old soil and sewer systems. When the machine is in operation the smoke in the pipes has a pressure of ½ ounce per square inch or more, as desired, which is sufficient to fill the entire system with smoke without forcing the water from the traps. The pressure of the smoke is indicated by the small water gauge shown at the left of the engraving, which when the machine is not in use can be detached to prevent being broken. It is described as being as convenient for carrying as a plumber's furnace, weighing less than 15 pounds, and very simple in operation. To prepare for use the loose cylinder is removed and a small quantity of water poured in the outside chamber. In the fire pot, in the inside chamber, is placed a piece of greasy waste, which being ignited produces a dense smoke. Replace the cylinder and move it up and down and a dense volume of smoke is given off. The Bailey-Farrell Mfg. Company, in directing the attention of plumbers, inspectors and boards of health to this device, describe it in the following way: "The Eureka smoke testing machine was originated and invented at the urgent request of the Plumbing Inspector of the city of Pittsburgh, for a simple and efficient tool that would enable the plumber to apply the penetrating smoke test and by it prove his work perfect. This tool enables the official inspector to certify with confidence that a sewer system in a modern dwelling is beyond doubt in a sanitary condition, thus relieving the plumber from responsibility, and giving to the occupant of the dwelling that confidence in the sanitary condition of his plumbing appliances not otherwise attainable."

A Plumber's Card.

During the agitation in England over the pending Plumbers' Registration bill the following bit of oddity and sarcasm was sent to the London *Ironmonger:*

GOOD DRAINAGE IS CONDUCIVE TO HEALTH!

Have your

DRAINS AND SANITARY FITTINGS

Tested by a thoroughly

PRACTICAL REGISTERED PLUMBER.

DO not entrust such important work to the Botch Men, who have the audacity to style themselves Sanitary Engineer, Chimney Sweeper, Scissor Grinder, Cobbler, Grave Digger, Undertaker, Plasterer, Cabinet Maker, Stove and Range Fitter, Chairmender, Pig-sticker, and a thousand other things.

If you want reliable work done by a man who has made Sanitary work a life's study, get

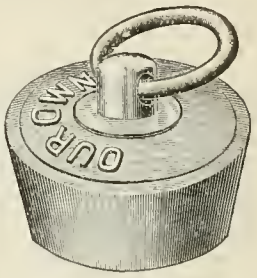
———, R.P.C.

OF ———,

to do it for you.

Our Own Basin Plug.

The accompanying illustration shows one of Our Own basin plugs, manufactured by H. O. Canfield, Bridgeport, Conn. It is described as made of a good quality of white rubber, with



Our Own Basin Plug.

nickel trimmings, and being put up one dozen in a box, forms, it is pointed out, an attractive addition to the goods on the shelves of the dealer. They are made in all regular sizes and finished in nickel.

TRAPS AND VENTS.

AT A REGULAR MEETING of the Master Plumbers' Association of Troy, N. Y., held on February 9 the following officers were elected: President, W. H. Barnes; vice-president, William F. Quinn; treasurer, William Ferguson; secretary, James Temple. The delegates to the State convention were George Bowman, E. J. Murphy, James Temple. The alternates, William F. Quinn, Charles Mills, Samuel Norris.

E. J. RYAN, Danville, Ill., is showing commendable enterprise in adding electrical plating to his line of work. In his shop on North Vermillion street he is placing vats and electrical appliances for plating with silver, nickel and copper.

THE CATALOGUE AND PRICE-LIST just issued by the Haydenville Mfg. Company, 73 Beekman street, New York, is a handy little volume, the size and neatness of which will appeal to the trade. It contains 560 pages, measures 6 x 4 inches and is bound in flexible covers with rounded corners. Included within its pages is a very extensive variety of brass goods for water, gas and steam. Among the goods of which they are the only manufacturers are the Haydenville steam metal ground key work, steam metal compression work, brass and steam metal pumps, syphon and ventilating water closets, bidet attachment, patent tanks, patent safety and vacuum valves; also a number of other specialties. The index of the goods is particularly well arranged; a short index, showing the general classification, being given before the general alphabetical index, by which reference to particular goods is made. From the short index a comprehensive idea of the contents may be obtained. It is divided as follows: Ground key work, compression work, hardware goods, self closing work, Peck's improved work, miscellaneous brass goods, pumps and hydrants, sanitary specialties, cast iron soil pipe and fittings, tools and steam work. The volume is profusely illustrated and tables of sizes and prices are given in all cases. Accompanying it is a sheet of discounts.

THE STORE OF JAMES AHERN, 280 Asylum street, Hartford, Conn., was specially arranged to make a fine show-

ing to the visiting plumbers at the State convention. One room was fitted as a bathroom and to display water closets and electric light goods. The Smith & Anthony Company were represented by a white marble lavatory, a Roman bath and Sanitas Regal and Royal; Peck Bros. Company by a sitz bath, a Tennessee marble lavatory, a triple jet syphon closet and a variety of plumbers' brass and nickeled goods, and the W. S. Cooper Brass Works by a Nautilus water closet. A handsome carpet covered the floor, and the side walls had the effect of tiling.

GEO. M. COUCH & Co., Hartford, Conn., in some recent hot water heating contracts have used the Caswell hot water circulator.

THE NORTHWESTERN PLUMBERS' ASSOCIATION met February 6, at Appleton, Wis., and elected officers as follows: P. H. Ryan, president; Geo. McCall, Chippewa Falls, vice-president; W S. Patterson, recording secretary; Henry Shisholm, Oshkosh, corresponding secretary; Geo. Smith, Oconto, sergeant-at-arms.

THE WHITLOCK COIL PIPE COMPANY, Elmwood, Conn., are issuing a new price-list of iron, brass and copper pipe coils made up to order. The circular contains illustrations showing the character of coils made. The company are now filling an order for six coils, each of which contains 300 feet of 2½-inch pipe. The pipe is joined by welding and bent without flattening while it is cold by special hydraulic machinery.

THE STOCK OF PLUMBING GOODS carried by Stockton & Kuhl has been purchased by David W. Yarbrough, dealer in plumbing supplies and gas fixtures, 18 East Hunter street, Atlanta, Ga.

AT A REGULAR MEETING of the Master Plumbers' Association of Boston and vicinity, held on February 8, the following committee was appointed to constitute a Conference Committee to confer and act with a similar committee from the journeymen's Union, that harmonious relations may exist between the two associations: William H. Mitchell, chairman; J. Warren French, Isaac Riley, J. K. Tulley, John Crawford, P. H. Winn, Robert F. Brown.

AS THE RESULT of a previous visit the State vice-president of Massachusetts, John F. Deedy, and Executive Clerk Crosby visited Malden to assist in the formation of an association of master plumbers in Malden and vicinity. On February 2 a second meeting was held and a permanent organization formed, with the following officers: President, B. O. Tilden, Malden; vice-president, A. F. Curtin, Medford; corresponding secretary, Alonzo A. West, Malden; financial secretary, H. A. Myers, Faulkner; treasurer, J. W. Hebblewaite, Melrose. More than 20 members were enrolled, with more promising to enter, representing Melrose, Malden, Medford, Faulkner, Everett and Maplewood.

THE PLUMBING FIRM of Desormo & Co., at Chillicothe, Ohio, composed of Charles Desormo and Dr. J. M. Stephenson, have been dissolved, Mr. Stephenson retiring.

H. MARSHALL has arranged a fine display of plumbing goods at his shop on the south side of the Square, at Lincoln, Ill.

THE COPARTNERSHIP heretofore existing between A. J., H. E. and W. F. Meyers, plumbers and tinsmiths, Faulkner square, Faulkner, Mass., is dissolved, A. J. Meyers withdrawing from the firm. H. E and W. F. Meyers will continue the business.

AN UNLICENSED PLUMBER in New York City was convicted February 12 and fined $25 for conducting business without a license. This is the first trial and conviction under the new laws, chapter 602, laws of 1893, and the offence was severely commented on by Justice Grady, who presided. The prisoner was told if he appeared before the court again on a similar charge he would be imprisoned. The fine was made light on account of the plumber's inability to pay a heavier one.

THE MASTER PLUMBERS' ASSOCIATION of Buffalo, N. Y., is sending out a notice to the trade through Charles F. Mensch, secretary of the Entertainment Committee, and Charles Geiger, chairman, announcing that the sixth annual convention of the State Association of Master Plumbers will meet in Buffalo on March 6. The notice adds that it is the earnest desire of the local association of Buffalo, as well as the State association, that every city and town should be represented at the coming convention, as matters of great importance to every plumber of the State will be brought up before the meeting. The Buffalo association is also desirous of knowing, so far as possible, how many from the different cities and towns may be expected. The headquarters of the delegates will be at the Tifft House, special rates having been made for them at $3 a day.

THE CRAWFORD HOUSE, Boston, Mass., was the scene of a hospitable gathering on February 9, when the master plumbers of Boston and vicinity gave a complimentary dinner to Isaac Riley, one of their most esteemed fellow members, on the eve of his departure for a trip to Europe. State President W. H. Mitchell was toastmaster. An incident of the evening was the presentation by James F. Davlin of a handsome token of remembrance, which he accompanied with some excellent advice in rhyme. National President Daniel G. Finnerty and ex-National Financial Secretary Thomas J. Tute both recounted incidents of their early days when they were journeymen with the guest, and Edwin Mills praised his sterling qualities in fitting verse. The following were among those present: Wm. H. Mitchell, chairman, president of State Association; J. Warren French, president Boston Association; Daniel G. Finnerty, president National Association; John B. Smith, Lewiston, Maine, State vice-president of Maine, N. A. M. P.; W. Emmet Crosby, executive clerk, N. A. M. P.; John W. Coaden, financial secretary Boston Association; T. J. Tute, E. Sheriffs, Wm. Lumb, Jas. F. Davlin, Jas. Tucker, N. W. Tucker, W. Bates of the Grundy Brass Works, H. H. Collins, Jas. O'Connell, J. C. Kelley, Thos. Sharp, T. J. Kurkell, Frank A. Titus, Edwin Mills.

GEORGE REILLY and Louis Lee have formed a copartnership in the plumbing business. They have a shop at 16 Gage avenue, Glens Falls, N. Y.

JOHN S. CRAIG, 59 Farmington avenue, Hartford, Conn., makes a fine display of modern plumbing fixtures in a handsomely fitted bathroom which is a feature of his showroom.

N. CLEMENS, plumber, has leased the store room at 70 West Main street, Massillon, Ohio, and will remove to that location soon.

FRANK A. WENDELL entertained National President Finnerty and his clerk at Salem, Mass., January 30, when preliminary arrangements were made for the association that was organized February 6 with 19 members, and who elected the following officers: President, Robert Robertson, Beverly; first vice-president, Frank A. Wendell, Salem; second vice-president, E. G. Kelly, Peabody; secretary, John H. Trow, Salem; treasurer, J. A. Andrews, Salem.

AN EFFORT IS BEING MADE to have several changes made in the Massachusetts State plumbing law that do not meet with the approval of the Boston master plumbers or National President Finnerty, particularly that which is to remove the requirement that plumbing inspectors must be practical plumbers.

THE IOWA STATE PLUMBERS' ASSOCIATION met at the Kirkwood House, Des Moines, February 6. The convention was called earlier than usual this year so that the plumbers could have an opportunity of asking the Legislature to enact a law to improve the sanitary conditions of Iowa cities. The bill that the association will work for provides for the selection of an inspector of all plumbing work in cities of the first class. The following officers were elected: President, J. A. Harris, Sioux City; vice-president, Henry Ewinger, Burlington; secretary, John E. Allen, Des Moines; treasurer, Robert Clayton, Davenport. The following Legislative Committee was appointed: J. E. Allen, James Wallace, John Burnside, Des Moines; J. A. Harris, Sioux City. The next convention will be held in Burlington.

THE ALBANY IRON COMPANY were incorporated with the Secretary of State, at Albany, N. Y., this week, to manufacture plumbers' supplies, brass and iron work and boilers in Albany. The directors are P. J. McArdle, T. J. Sullivan, T. E. Kerwin, William Mulholland, and J. H. Kennedy of Albany. Capital, $15,000.

THE EXECUTIVE COMMITTEE of the National Association of Master Plumbers met in Boston on the 14th and 15th inst., for the transaction of regular business.

A. J. PURDUE, representing Peck Bros. & Co., manufacturers of fine plumbing goods, New Haven, Conn., spent Thursday at the convention of the Connecticut State Plumbers at Hartford.

THE STORE of Thomas Oakes, 11 Haynes street, Hartford, Conn., is well lighted and shows off to advantage a line of Volunteer and Furman boilers, gas stoves, several styles of syphon jet closets, steel baths, enameled baths and gas fixtures. He has a large and well equipped shop and warehouse.

T. H. LANGDON, Hartford, Conn., recently succeeded to the plumbing business he previously carried on with a partner. He makes a specialty of suburban residence work, using Rider & Ericsson hot air engines for filling tanks, Dalton & Ingersoll Boston closets, enameled baths, and is at present well occupied. He also does hot water and steam heating.

PECK BROS. & Co., 259 Wabash avenue, Chicago, report a large increase in orders for general and specification work, from city and country. They anticipate a continual increase in trade and a healthy spring business.

J. H. Case has sold his interest in and retired from the plumbing firm of the J. H. Case Company, Green Bay, Wis., and that concern now do business under the name of the Green Bay Plumbing & Heating Company. John Callahan is president and John Anderson is secretary of the new corporation. Mr. Case is still in the plumbing business and has opened an establishment on Adams street.

The meeting of the Fox River Valley Plumbers' Association was held at Appleton, Wis., February 6, when the following officers were elected: President, P. H. Ryan, Appleton; vice-president, George B. McCall, Chippewa Falls; treasurer, J. Ahearn, Fond du Lac; recording secretary, W. S. Patterson, Appleton; corresponding secretary, Harry Cuisholm, Oshkosh; sergeant at arms, George Smith, Oconto.

Frank J. Knox, 314 and 316 Pearl street, Hartford, Conn., runs a full line of plumbers' supplies, from marble slabs and syphon jet closets to soil pipe and oakum. Steam and gas fittings, pipe and valves are made a specialty.

The Birkery Mfg. Company, Hartford, Conn., are busy filling orders for the Birkery patented high pressure ball cock, which is said to prevent hammering, singing or syphonage under any pressure.

The Durango Plumbing Company, Durango, Col., of which the firm members are F. B. Hannan, J. J. Gorman and F. H. Rivers, have dissolved partnership, F. B. Hannan retiring. Messrs. Gorman and Rivers will continue the business of the firm. Mr. Hannan intends opening a bicycle exchange.

M. L. Mandable, one of the prominent Chicago master plumbers, has moved his plumbing and gas fitting establishment to 258 South Clark street.

Edmund F. Butler, representing Dalton Ingersoll Company of Boston, found an abundant welcome with the plumbers at the Hartford (Conn.) convention.

W. H. Lloyd was at the plumbers' convention at Hartford, Conn., representing the Sanitas specialties of the Smith & Anthony Company, Boston, Mass.

C. G. Belfit represented the plumbing firm of Chas. Thatcher & Co., Waterbury, Conn., at the convention of plumbers at Hartford, Conn. He has secured the contract for heating the residence of the Rev. Hugh Trainor with a Gurney double crown hot water apparatus.

John D. Eldridge, plumbing inspector of New Haven, Conn., showed at the Hartford convention a valentine prepared by a quite young grandson, showing a plumber calking a joint in a soil pipe.

The local association of Master Plumbers of Boston entertained the Executive Committee of the National Association of Master Plumbers on Wednesday night. Among those present were President J. A. French of the Boston local, Daniel G. Finnerty, Jeremiah Sheehan, W. T. Goodman, M. J. Duffy, J. G. Weldon, David Smith, John Mitchell, John Trainor, Chas. T. Mensch, O. S. Kendall, John C. Brown, M. C. Hutchinson. An elaborate *menu* was disposed of and speeches were made by all, the orator of the assembly being James Davlin.

Henry Dunker & Co. are a new plumbing firm established at 325 Harrison street, Davenport, Iowa.

Connecticut State Plumbers.

The fourth annual convention of the Connecticut Master Plumbers' Association at Hartford, February 15, was the largest and most enthusiastic in its history. President Dibble of New Haven called the meeting to order and First Vice-President James Ahern of Hartford made an address of welcome to more than 100 delegates who were present. Routine business was then the order, a feature being the enrollment of 38 new members. During the session the Executive Committee of the National Association of Master Plumbers were announced and President Daniel G. Finnerty, Ex President Jeremiah Sheehan, Treasurer W. T. Goodman, James G. Weldon and M. J. Duffy entered and made brief addresses. At 2 p. m. the convention adjourned to the United States Hotel, where an elaborate dinner was elegantly served, accompanied by excellent music. James Ahern was toastmaster and introduced the speakers with grace and brilliancy. President Finnerty expressed his agreeable surprise at the success of the Connecticut association, and said the National Association was represented in every State, with a membership of over 3000, who did 90 per cent. of the plumbing in the country and were organized to promote sociability, sanitary legislation and trade protection. J. J. Wade of Chicago made the taking speech, and after making allusions, which created much laughter, to what he learned from James Ahern, he spoke of the good work of the association in elevating the craft. Other speakers followed, and it was 5 o'clock before the body adjourned to the hall to resume business. The following officers were elected: President, James Ahern, Hartford; first vice-president, J. B. Weiant, New Britain; second vice-president, C. S. Eames, Bridgeport; recording secretary, J. S. Craig, Hartford; financial secretary, R. H. Stohlhart, Middletown; treasurer, A. J. Clerkin, Hartford.

Builders' Tribute to Col. Auchmuty.

The National Association of Master Builders, in convention at Boston, Mass., on Wednesday last, adopted by a rising vote the following resolution in memory of the late Col. Richard T. Auchmuty of New York:

Whereas, The National Association of Builders mourns the death of Richard T. Auchmuty with a depth and sincerity which no words could hope to express; and

Whereas, In the founding and maintaining of the New York Trade Schools and in endowing others, Richard T. Auchmuty has conferred upon all young men who desire to follow mechanical pursuits incalculable benefits of precept and example, pointing out the way for others who may follow; and

Whereas, It is the earnest desire of every member of the filial bodies to offer some tribute to his life and work; to make some sign which shall indicate the deep sense of appreciation of his lifelong, self sacrificing and fruitful effort in the cause of education for the "American boy;" to extol, with earnestness, the true and consistent greatness of the man, the gentle simplicity of his nature, the tenderness and magnitude of his love for the boys of our country, which knew no limitations, and which gathered all to its shelter and encouragement, to share with his life and his possessions; and

Whereas, He had conferred distinction upon us by accepting an honorary membership in this association; therefore

Resolved, That the National Association of Builders, assembled in the eighth convention, offer this preamble and resolutions, inadequate though they may be, as a tribute to Richard T. Auchmuty and as an expression of the great and enduring sense of loss which his death has inflicted, and as a mark of fervent gratitude to his memory, to his character and to his work; and be it further

Resolved, That these resolutions become a part of the records of this convention; that a memorial page in the official report be set apart in his honor, and that they be sent to his family as expressing respectful sympathy at their irreparable loss.

Mica Gauge Glass.

The McClary Mfg. Company, London, Ontario, have applied for patents in Canada and the United States on an

Mica Gauge Glass.

improved gauge glass for creamer cans or liquid or dry measures, which they are putting on the market. The accompanying illustration shows a broken view of this new gauge glass, and the small cut at the side is a sectional view, illustrating the way the gauge is constructed. The special feature of it is the substitution of mica for glass as heretofore employed. The mica is held firmly in a tin frame, closely pressed together, so as to prevent all leakage, and enables the interior of the can to be seen as plainly as with glass. It is furthermore referred to as an improvement on glass, since it is not affected by heat, and will stand compression so as to make a perfect fit at the joint.

The rapid transit problem in Boston is about to be solved by the construction of subways for the electric cars. This plan is found to be the only one by which the obstacles to rapid transit presented by the narrow and tortuous streets of the city can be overcome. A bill has been prepared for presentation to the State Legislature, asking permission to make a tunnel 10,000 feet long, at an estimated expense, including land damages, of $5,000,000.

An ocean race of 14,000 miles came to an extraordinarily close finish last week in New York harbor. The race was between a Boston bark and a Nova Scotia ship, both of which left Hong Kong in October last. The Boston vessel had been anchored but one hour when her rival appeared in port.

TIN PLATES.

A Notable Wedding.

We have from F. H. Taylor, Philadelphia, the following account of a recent social event:

A very notable wedding was solemnized at noon yesterday, when Miss Guarantee Stamped, of Philadelphia, daughter of Heavily Coated Stamped, was united in marriage to Sir M. R. Terne-Plate, a son of the famous Lord Siemens Martin Steel Plate. The ceremony took plate at the Protestant Episcopal Church of St. High Grade, which was profusely decorated with ventilators, copper kettles and soldering irons, and was performed by the Rev. Fine Solder, rector of the church, assisted by Rev. Antimony Zinc and Rev. Bismuth Lead. The best man was Ensign Pure Tin. The ushers were William Wire, John Babbitt Metal, Robert Zinc, Clarence Iron Sheets and Joseph Continuous Ternes. The maid of honor was Miss Roofing Paint. The bridesmaids were Miss Emma Tongs, Miss Standing Seam, Miss Louisa Cleats, Miss Double Seamer, Miss Clara Side Flashing and Miss X. Terne Gutter. The bride was beautifully attired in a costume of agricultural brass spring wire, trimmed with tin shingles, wore a wreath of escutcheon pins with veil, had mica ornaments and carried a prayer book. The maid of honor wore a metallic brown costume and the bridesmaids wore seamless copper tubing, with old fashioned kerchiefs of stove boards reaching to the foot of the skirt, and carried bouquets of barbed wire nails. The bridesmaids entered the church upon each side of the chancel, and met the bridal party at the church door, escorting them to the chancel; the bride leaning on her father's arm, who gave her away. After the ceremony a largely attended reception was held at the residence of the bride's parents, 224 Full Weight street. The presents were many and costly. Late in the evening the happy couple left for an extended tour through the States and will be at home after March 31, at their new residence, 1894 Large Sale street, Chicago.

SCRAP.

THE TAIBACH TIN PLATE WORKS, Port Talbot, Wales, were recently sold at auction to D. R. David of that town for $72,000. The Yapitty Tin Plate Works, Loughor, South Wales, were also sold for $24,500 to a purchaser whose name has not transpired. In both cases the prices obtained were considered to be very low.

J. M. & L. A. OSBORN, Cleveland, Ohio, are distributing circulars calling attention to the terne plates which they carry in stock: Gilbertson's Old Method, Scott's Extra Coated, Hamilton's Best, N. & G. Taylor's Old Style, the Taylor Roofing, Merchant's Old Method and Roofing, also M. F. Old Style, Pontymister, Leominster, Alderly, Monongahela, as well as a number of their private brands, including Golden Star Old Style.

THE EXPORTS OF TIN PLATES from Great Britain during January show a small increase as compared with those of January, 1893, although the United States took 5000 tons less last month than in the corresponding period of 1893. The latter decrease was, however, more than offset by the increase in shipments to Russia, where the demand for tin plates for the Batoum petroleum trade is fast increasing. The total British tin plate exports last month were 31,969 tons, as against 31,377 tons in January, 1893. Of these amounts shipments to the United States were, in January, 1894, 18,000 tons, and in January, 1893, 23,000 tons.

A BALTIMORE DISPATCH states that the Baltimore Iron, Steel & Tin Plate Company of that city have secured control of the rolling mill and tin plate works of Coates & Co., at Locust Point, and will reopen them next week. Instead of simply dipping the plates, as has been done heretofore, the company will roll black sheets, and use these in the manufacture of their tin plates.

THE TOTTEN & HOGG IRON & STEEL FOUNDRY COMPANY, Pittsburgh, Pa., have just closed a contract with the Emlyn Steel & Tin Plate Company of Summitville, Ind., with main offices in Chicago, for a complete tin plate plant. It will consist of two 24-inch hot rolling mills, three 20 inch cold rolling mills and 600 horse-power Etna engine, with countershaft and gear wheels, four large steel tubular boilers, 150 horse-power engine, two doubling shears, one trimming shear and additional rolls for the hot and cold rolling mills. Work on this contract will be commenced at once and the machinery will be shipped as fast as possible. The Emlyn Steel & Tin Plate Company for some time past have been operating a tinning plant in Chicago, buying their black sheets in the open market; but on the completion of the new works the entire plant will be concentrated in Summitville, Ind.

VERY GREAT DISTRESS EXISTS, says the London *Iron and Steel Trades Journal*, in the Welsh tin plate districts. In addition to a large number of works totally idle, there are several in which less than half the mills are working, and where the men are only employed two or three shifts of six hours each. It is declared that numbers of people are literally starving, and that at least $5000 weekly is required for their relief. Some of the men are working on the roads as common laborers at from 50 to 60 cents a day.

THE NEW CASTLE STEEL & TIN PLATE COMPANY, New Castle, Pa., issue a circular describing the various tin plates they manufacture. The list includes the following brands: New Castle Best Coke, New Castle Coke, New Castle Russia Charcoal and New Castle Juniata Charcoal. The following terne plates are also referred to: New Castle Real Old Method, New Caatle Genuine Extra Coated and Shenango.

THE FOLLOWING WELSH TIN PLATE WORKS, some of which are ordinarily among the largest producers, are at present idle: Caldicot, Panteg, Pontypool, Ponthydyrun, Maesteg, Jersey, Foxhole, Landore, Penclawdd, Midland, Clyne, Cilfrew, Melyn, Burry, Ysnitty, Llangennech, Morfa Old Works, Morlais, Hendy, Glanamman, Ystelyfera, Nantlyglo, Villiers (Briton Ferry), Llantrissant, Blaina, Abertillery, Gurnos, Abercarn, Pontymister and Waterloo.

N. & G. TAYLOR COMPANY, Philadelphia, Pa., have secured the contract for the tin for the Fourteenth Regiment Armory, Brooklyn, N. Y., the brand to be used being Genuine Taylor Old Style Heavily Coated roofing tin. The first shipment will amount to over a carload. The same plate is being used on the Inman Steamship Company's pier on the North River and calls for over 200 boxes of the brand. The Grocers' Exchange Building has just been covered with it, as well as several other buildings in and about New York City.

THE GLOBE TIN PLATE COMPANY, who were recently incorporated in Illinois, are to erect works in Grant County, Ind., for which contracts have been let. For private reasons the exact location of the plant has not yet been made public. The main building will be 40 x 150 feet, with a wing 40 x 50 feet at each end, and be fitted up with modern appliances at a cost of $30,000. The engine room will adjoin the center of the main building on the opposite side from the wings, and be 30 x 40 feet. An office building, 35 x 45 feet, is also to be erected and furnished with all conveniences. The company's headquarters will be in Chicago.

THE OUTPUT OF TIN from the mines of Cornwall in 1893 was 7288 tons, against 8000 tons in the previous year, the average price for the year being $229.40, against $230.50 per ton in 1892. The *British Trade Journal* reports that the past year was far from being an encouraging one as regards the position of Cornish tin mining. Although the output of the mineral was fully up to the average of past years, so far as the larger mines are concerned, the downward movement in prices caused the existence of several of the smaller undertakings to cease.

THE works of the New Castle Steel & Tin Plate Company New Castle, Pa., are in full operation, turning out about 30 tons of black sheets per day, about one-half of this product being finished into tin and terne plates. Some extensive improvements are now under way by this concern, and when completed will materially increase their output.

A statement issued by the Chief of the Bureau of Statistics, at Washington, shows that 13,126 immigrants arrived in the United States during December, 1893, as compared with 22,719 in the same month of 1892. During the entire year the number of immigrants entered was 488,775. In 1892 it was 543,487.

THE LETTER BOX.

Reading Gas Meters.

From H. J. Davis, *Friendship, N. Y.*—I notice in *The Metal Worker* of February 10 that a correspondent sends a clipping from a New York paper relative to housekeepers' gas bills. Being a gas fitter and engaged in setting meters for a gas company, I am familiar with this class of work, and I submit the following for the housekeeper's benefit. Gas meters are looked upon by some people as a bugaboo—something that the collector of the bills looks at and makes out his bill to suit himself. This is a mistaken idea. No two families will burn gas alike; one family's monthly gas bill will be $4, and another's will be $6, showing the latter family burned more gas than the former. Different makes of stoves with different sized burners and mixers will make the difference. The reading of gas meters is a very simple matter, and if the gas company's collector is an honest man he ought to instruct the housekeeper how to read the meter whereby she as well as the gas company can know her monthly and daily consumption. In the gas meters which I set and are used here, the registering face has six dials; the upper one registers 2 cubic feet at one revolution; underneath to the right is the dial registering the hundreds, next dial the thousands, next the tens of thousands, next the hundreds of thousands, and the last dial to the left the millions. Note the position of the arrows on the dials, beginning at the left and reading to the right, and add up the amount registered by the dials. Making a record at the end of the month where the meter stood, and beginning there to read for the next month's amount, housekeepers will not be beaten by the gas company.

Cleaning Solder.

From H. I. T., *Scranton, Pa.*—Will you kindly give some method for cleaning wiping metal that has been made out of old joints?

Answer.—The usual method for cleaning solder that contains zinc or impurities is to burn sulphur on the surface of the metal, stirring it constantly so that the impurities in the solder may be brought in contact with the burning sulphur. The resulting dross can be skimmed off. A former correspondent of *The Metal Worker* recommend the use of common salt for the same purpose, which, he said, gave just as good results as sulphur and was much more pleasant to use.

Natural Wool Filters.

From I. C., *New London, Conn.*—In reading a foreign journal I saw where an English authority makes the following statement in describing the material used for filtering air for a heating plant, which no doubt will interest the Letter Box readers: "The air filtering material is natural wool, which is found to be far superior to cotton wool, as on account of its greasy nature it does not mat together when the incoming air is heavily charged with moisture. An example of such a filter may be seen in this town at the Shire Hall, where it has given great satisfaction."

Freezing Boiled Water.

From H. V. T., *Scranton, Pa.*—Please inform me through *The Metal Worker* why it is that water once heated will freeze quicker than cold water.

Answer.—In its normal state, or rather as it is ordinarily found, water contains a considerable quantity of air, held, we may say, in solution. The first effect of heating water is to expel this air, after which the formation of steam takes place. Water that has been boiled, therefore, is water devoid of air, and it is on this account that it freezes more readily than ordinary water which contains air. The reason is due to the fact that in the formation of ice it is necessary first to expel the air, the same as in the formation of steam. The crystallization, therefore, is retarded by the work of getting rid of the air that is dissolved in the water. This air is thrown off at the surface of the water and is also imbedded in the ice, as is seen in the air bubbles scattered through the frozen surface.

Plans for Heating Water.

From E. A. C., *Minneapolis, Minn.*—I inclose you sketch of a plan which I have used for heating water that has proved very successful and needs no further description than is given in the sketch.

Note.—We acknowledge the receipt of the above letter and do not reproduce the sketch, as it is practically the same as that which appeared in *The Metal Worker* of December 30, 1893, under the head of "Reverse Circulation," and only corroborates the information given by the former correspondent.

Difficulty with Driven Well.

From M. W., *Little Falls, N. J.*—I connected a pump some time ago to a driven well, which is about 35 feet deep. The well was driven by means of a 1¼-inch galvanized iron pipe with a point on it. The pump does not work very well; it is very hard to operate and the handle flies up every time it is lowered, acting as if there was something on the lower end of the pipe. I think that if air could get down to the water the pump would work all right. Can *The Metal Worker* or any of its readers give me some idea of the cause of the trouble so I can remove it?

Answer.—If the water level is 35 feet below the pump the trouble is due to attempting to lift water by suction beyond the greatest possible limit, and can be overcome by placing the valve chamber connected with the piston of the pump several feet below the point at which it is at present located. We do not believe, however, that our correspondent could have overlooked this important point. We would be glad to hear from our readers who are familiar with driven well work.

Water Backs Bursting Repeatedly.

From F. K., *Bound Brook, N. J.*—Having read in *The Metal Worker* of February 3 about the bursting of water backs in Brooklyn, I would like to ask if it was not partly due to the check valve in the cold supply of the boiler, and should not the supply pipe always be open to act as a safety valve?

Answer.—Without the check valve, in case of steam forming in the water back, the pressure would work against the street pressure and take care of the expansion of the water. With the check valve preventing relief from the back pressure, due to the expansion of the water, the strength of the fixtures would be tested. In this expansion of the water on being heated might be found another cause for the bursting of the water back. In case of the fire having gone out and all the fixtures being filled with cold water and a fire then started, any back pressure due to the expansion of the water would close the check valve, and the expansion might be sufficient to burst the water back as reported if it chanced to be the weakest part of the system.

Bad Stove Mounting.

From M. S. L., *Richmond, Va.*—I have read the different articles in *The Metal Worker* on failure to bake. A pernicious practice of the stove manufacturers at present is not puttying the stoves in all the joints. My experience in the last two years has cost me $200 in taking stoves apart and reputtying the joints and putting together afterward. I have now some stoves with no putty on any of the joints that I will return to the manufacturers. I sell about 800 stoves a year and now demand of the manufacturers that the stoves shall be thoroughly puttied at all joints, or they will be returned. I think that this is a growing evil and I have had a great deal of trouble with it.

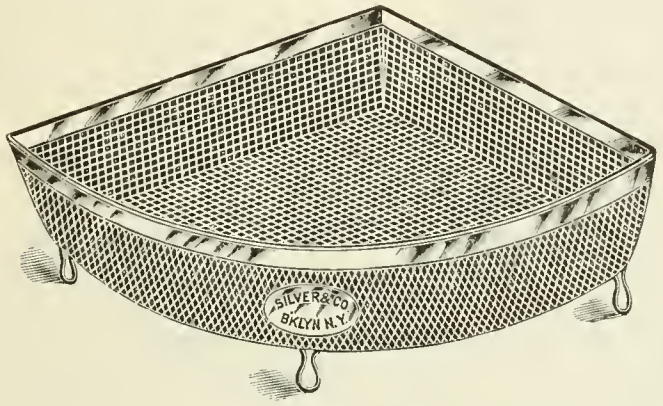
Buckeye Parlor Grate.

From W. H. B., *Burlington, Vt.*—Will some reader of *The Metal Worker* kindly inform me, through the Letter Box, where and by whom the Buckeye parlor grate is manufactured?

THE RETAIL STORE.

Sanitary Sink Basket.

Silver & Co., 304-310 Hewes street, Brooklyn, with New York office 20 Warren street, are introducing a sink basket, as illustrated herewith. This is made of tinned wire, measuring 8½ inches along the straight edges and 10 inches from the center of the curve to the corner at the back. It is designed to be placed in the corner of the sink, into which all water is thrown, so that the basket may retain all the solid matter from the dirty water. The water thus passes through, leaving behind refuse matter, such as tea leaves, coffee grounds, &c., preventing flooding and insuring a clean waste pipe. The solid matter may afterward be burned or otherwise disposed of.



Sanitary Sink Basket.

Flour Bin and Sifter.

The illustration herewith given represents a flour bin and sifter, offered by Silver & Co., 304-310 Hewes street, Brooklyn, and 20 Warren street, New York. The bin combines a receptacle, aërator and sifter, made of heavy tin, without seams, japanned and painted on the outside. The handled cup underneath the sifter is graduated, holding 3 quarts, and six turns of the crank gives a quart of sifted flour. The manufacturers claim that the bin keeps the flour or meal sweet and clean any length of time, that it is a safeguard against mice and insects; that the revolving flanges inside the bin thoroughly aërate the flour, keeping it fresh and free from mold or mustiness, and that its use avoids labor, waste and untidiness of reaching into barrels or sacks. The bins are made in three sizes, to hold 25, 50 and 100 pounds, and are designed to be placed on a table or shelf.

Flour Bin and Sifter.

The Columbian Faucet Can.

Hart Mfg. Company, Troy, N. Y., are putting on the market the can herewith shown, designed for oil and gasoline. The spout is hung on a swivel so that the stream can be stopped at once by raising the spout. It is claimed that the cut-off is so perfect that there is no possibility of drip or of waste. The spout, when not in use, is turned up within a hood, making it safe from breakage in shipping or loss of oil when not in use. The manufacturers state that the faucet is of brass and may be safely guaranteed not to leak, drip or break with proper handling, as it has no packing and is ground in such a manner that all wear is taken up at the end by a set screw, which can be adjusted by any one. The can is made of galvanized iron with tin top and has a perforated drip cup to prevent the escape of gasoline during transportation. It is stated that the can is safe and convenient, and that it may be closed up perfectly tight. In Fig. 2 is shown a top with hasp, which is designed exclusively for oil men, so that they only can fill the can, as the person having the key alone has access to the can for filling. The can is made in 5 and 10 gallon sizes.

Fig. 1.—The Columbian Faucet Can.

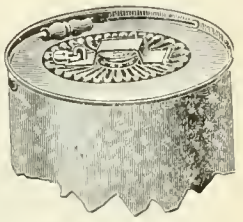
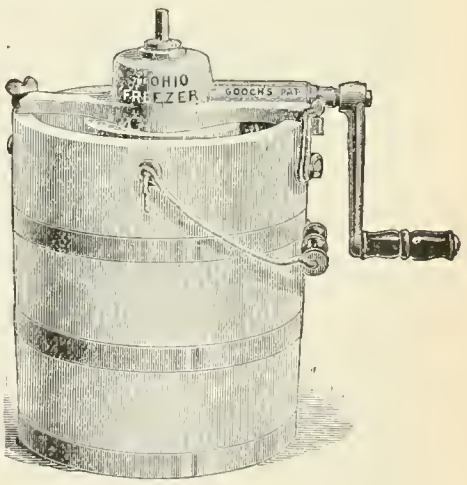


Fig. 2.—Top with Hasp for Lock.

The Ohio Freezer.

The cut herewith represents a freezer offered by the Sam'l C. Tatum Company, Cincinnati, Ohio. The manufacturers state that the principal feature is the thorough way in which the cream is stirred up from the bottom; that there are no pockets left undisturbed, nor are there any places in the dasher to become clogged and difficult to clean, and that the dasher works clear out against the sides of the can. The dasher may be operated either from the side, as illustrated, or the handle may be placed upon the projecting end of the dasher itself. The can and the dasher are always given opposite motions and, the manufacturers claim, just

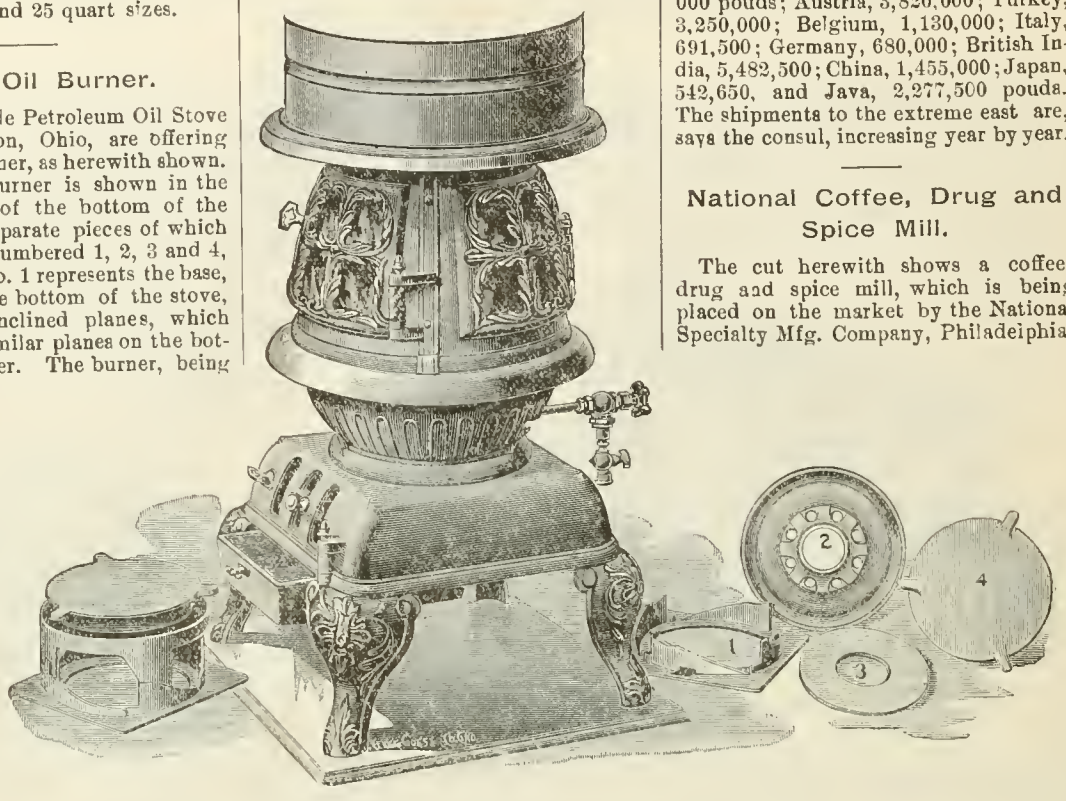


The Ohio Freezer.

as many motions as are necessary and no more; also that while the dasher goes through the top of the housing there is no chance for oil or dirt to drop through into the can. Freezers with crank are made in 2, 3, 4, 6, 8, 10, 12, 16, 20 and 25 quart sizes and with fly wheel in 16, 20 and 25 quart sizes.

Crude Oil Burner.

The Ohio Crude Petroleum Oil Stove Company, Ironton, Ohio, are offering the crude oil burner, as herewith shown. The complete burner is shown in the cut at the left of the bottom of the stove, and the separate pieces of which it is composed, numbered 1, 2, 3 and 4, on the right. No. 1 represents the base, which fits on the bottom of the stove, and has four inclined planes, which correspond to similar planes on the bottom of the burner. The burner, being



Crude Oil Burner

placed on the base and slipped into the lower part of the stove through the ash pit door, is rotated one-fourth revolution to the left; the planes acting on each other raise the burner to its place. The oil trough extends the entire distance around the burner, while the line of small holes surrounding the central opening in the burner is covered by plate No. 3, which partially covers the oil gutter. The small holes are cut away a little on the side next to the oil gutter, the object of the holes being to admit a sufficient quantity of air under plate No. 3 to support combustion, which it does, it is explained, by passing over the surface of the burning oil, and, mingling with it, causes a highly inflammable mixture, which passes out under the outer edge of plate No. 3. It is further explained that there it comes in contact with a volume of fresh air, which passes up through the central opening, and, striking against the bottom of plate No. 4, is deflected so as to come in contact with the vapor of the burning oil, supplying it with oxygen and making a mixture which burns with a bright blaze and intense heat. Testimonials attest to the efficiency of the burner and the satisfaction it gives, and the local Board of Insurance Underwriters are issuing policies permitting the use of the device. We are advised that the burner for heating stoves is at present only adapted for adjusting to the cook stoves made by the Foster Stove Company, Irontou, Ohio. Later, however, they will be made to adjust to any cook stove.

HENRY LEITCH is a Hartford, Conn., plumber who makes a specialty of hot air heating. He used 16 Barstow's Bay State furnaces last year.

The Handy Holder.

The accompanying illustrations, Figs. 1 and 2, show a handy holder which H. C. Weidenmann, 3517 Wallace street, Philadelphia, is putting on the market. The holder is made of sheet steel, and nickel plated. The shape of the clamp allows of adjustment to bars of any shape, round, square or oval. A tongue on one side of the clamp engages, upon pressure, with lips on the other side,

Fig. 1.—For Horizontal Bars.

thus when in service locking the holder securely to the bar. A strip of rubber on the inside of the clamp prevents scratching or rattling. The holder was designed chiefly for the purpose of holding or carrying decorations, coats, umbrellas or packages of any kind on

Fig. 2.—For Vertical Bars.

bicycles, although it is adapted equally as well for use on wagons or carriages as a rein or rug holder. It may also be used for a store window clip and for a variety of other purposes.

The Belgian Consul at Odessa, Russia, has recently forwarded to his Government a report of the petroleum trade of the Caucasus, from which it appears that 24,921,340 pouds (pouds = 36 pounds avoirdupois) of petroleum were shipped from Batoum during the first half of 1893, in addition to several million pouds of naphtha, lubricating grease and naphtha residue. Of the petroleum the principal recipient countries were as follows: England, 4,325,000 pouds; Austria, 3,820,000; Turkey, 3,250,000; Belgium, 1,130,000; Italy, 691,500; Germany, 680,000; British India, 5,482,500; China, 1,455,000; Japan, 542,650, and Java, 2,277,500 pouds. The shipments to the extreme east are, says the consul, increasing year by year.

National Coffee, Drug and Spice Mill.

The cut herewith shows a coffee, drug and spice mill, which is being placed on the market by the National Specialty Mfg. Company, Philadelphia. The mill is constructed of iron, the hopper and body being octagonal in shape, with round base. The novel feature in the mill is in the grinding adjustment. Coarse or fine grinding may be done by screwing or unscrewing the corrugated nut seen on the shaft. The nut is fitted with a brass

National Coffee, Drug and Spice Mill.

washer keyed to the shaft in such a way as to form a dead stop and thus cause the nut to revolve with the shaft. Loosening of the nut is, it is claimed, in this way entirely obviated. The mill is handsomely finished and ornamented and is pleasing in appearance. It is made in two sizes, Nos. 1 and 2, the latter having wheels instead of crank.

STOVE TRADE NOTES.

Cupola Management.*—IV.

BY DR. EDWARD KIRK.

Front.

The front opening of the modern drop bottom cupola is made so small that it is not necessary to place an apron or breast plate over it to hold the front or breast in place, as is done with the draw front cupola. The material used for putting in the front is generally the same as is used in making up the spout. The front is generally put in after the fire has burned up, but some melters put in the front before lighting and light from the tuyeres. Others make up the tap hole and half the front with a stiff mixture of fire clay and sharp sand before lighting up and fill in the other half after the fire has burned up. But as a general rule the entire front is left open to give draft for lighting, and the front is put in after the fire is burned up and about ready for charging. This gives sufficient time for drying it before the blast is put on.

When about to put in the front the ashes and dust are carefully brushed from the spout where the front is to be made, and the spout and front opening are wet all around with water or clay wash to make the front material adhere and insure a good joint. A breast of small pieces of coke is built in front of the fire, or a small board cut to fit the front with a notch in the bottom for the tap hole is placed in front of the fire to prevent the front material being rammed or pressed too far back into the cupola. A small iron bar or a round wooden stick is then laid in the bottom of the spout to form the tap hole.

If the front is made of molding sand or other material that is likely to crumble at the tap hole and be cut away by the stream of iron or be broken away by the tap bar, a little fire clay and sharp sand, or other refractory material, is placed around the bar or stick to form the tap hole. The front material of molding sand or loam is then thrown in and rammed solid against the board, sides, top and bottom of the opening. If the front is made of clay or sand, and worked wet, it is made into balls and pressed into place with the hands. When the opening has been filled the front is cut away downward and inward from the top and sides of the opening to the bar forming the tap hole, until the tap hole is not more than 1½ inches long. The surplus material from the front is then removed from the spout, the bar drawn from tap hole and the front and spout carefully trimmed up.

If the spout lining and front have been made up with clay and sand, or other wet material, a wood fire is built on the spout to dry it and the front. When the spout and front are made up with molding sand or loam they are generally dried by the flame from the tap hole before stopping in, and an iron plate is sometimes laid on top of the spout to concentrate the heat upon it.

Size of Tap Holes.

The size the tap hole is made depends upon how the iron is to be drawn from the cupola. If it is desired to run a continuous stream from the cupola the tap hole is made small to suit the melting capacity of the cupola. If it is desired to accumulate a large body of iron in the cupola and fill a large ladle rapidly when the cupola is tapped the hole is made large. The tap holes are made of various sizes from ⅝ inch to 1¼ inches diameter, to suit the different kinds of work. When it is desired to run a continuous stream it is very desirable that the tap hole should not be cut and enlarged by the stream. This is generally prevented by placing a very refractory material around the rod forming the tap hole. But some melters have a form in which they mold a tap hole from a carefully prepared material that will not cut and dry it in an oven or on a stove. This tap hole form, when thoroughly dried, is placed in position on a split fire brick and the front made up around it, which always insures a regular sized hole throughout the heat.

The front is generally made the full thickness of the lining and cannot be forced out by the pressure of molten iron if properly put in. When the front material is worked too wet it falls away from the opening at the top when drying, and the opening must be closed to prevent the escape of the blast. If the tap hole is made too long the iron may chill in it and the cupola cannot be tapped without cutting a new hole. This makes very bad work, for the iron is generally melted from the old tap hole by the stream passing through the new one, and the two holes become one. It is then very difficult to stop in or control the flow of iron.

When the front material is poor it melts into a semi-fluid slag that settles down and closes up the tap hole with a tough adherent slag that is difficult to remove. When this occurs the tap hole can only be kept open by continually opening it up with a tap bar. The only way to overcome this difficulty is to use a more refractory front material. Mineral fluxes sometimes make a front material fusible that is not otherwise fusible. When trouble is experienced in keeping the tap hole open when using a flux, or after one flux has been substituted for another, the composition of the front material must be changed or another material used.

When no board is used and the front material is rammed back into the fire until it becomes solid in the front, the front is ragged and soft on the inside and melts and makes a bad tap hole even when the material is good. A good front or spout lining can always be made from fire clay and sharp sand by mixing them in right proportions for the purpose for which they are to be used.

Locating Tap Holes.

I have already described the manner of putting in the front and forming the tap hole and shall here only consider the location and number of tap holes. The tap hole is placed in the side of the cupola from which it is most convenient to convey the iron to the work to be poured and it makes no difference in the working of the cupola upon which side it is placed if the bottom is sloped to throw the iron to the hole. One tap hole is sufficient to run the iron from any ordinary cupola, but two are frequently put in. In some cupolas two fronts and tap holes are put in side by side only a few inches apart and two spouts are made up so the tap hole can be kept in better order for drawing off the iron. They are tapped turn about, and in case too great a quantity of melted iron accumulates in the cupola they are both opened at one time. Two tap holes placed in this way can only be worked for hand ladle work at the same time and they cannot be worked to advantage even for that, for they are so close together the men are in each other's way. One tap hole if properly made and managed will run off all the iron a cupola will melt and it is poor cupola practice to put in two fronts and tap holes in this way.

Two tap holes are frequently placed in a cupola for convenience in carrying the iron from the cupola to the molding floors. They are generally placed on opposite sides of the cupola, to save carrying the iron around the cupola or from one molding room to another. Two tap holes are also placed in cupolas to facilitate the removal of the iron in hand ladles. Six 40-pound hand ladles are all that can be safely taken from a spout per minute. When more than this number of ladles are filled and removed per minute, the men have to move so rapidly there is danger of a clashing of ladles and spilling of iron, and when a heavy stream once gets away from the men and falls to the floor, it spatters and flies so that it is difficult to stop in or again catch it. When more than 8 tons are melted per hour in a cupola for hand ladle work, two tap holes are always put in. They are placed in the side of the cupola that is nearest the work to be poured, but always at a sufficient distance apart to admit of the men catching at one spout being out of the way of those catching at the other.

Slag Hole.

A slag hole for drawing off slag is sometimes placed in a cupola, but it is not used except when the cupola is run beyond the capacity to which it can be run successfully without slagging. The hole is placed below the level of the tuyeres, and when it is desired to accumulate a large body of molten iron in a cupola the slag hole is placed high. When the iron is drawn from a cupola as fast as melted the hole is placed low. The opening through the casing and lining is generally made oval and about 3 x 4 x 5 inches.

The slag hole front when the hole is placed high consists of a plug of the same material used for the tap hole front. The plug is placed in the outer end of the opening and is from 2 to 3 inches thick. A hole 1 inch diameter is

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made through it for a tap hole, and the plug or front is cut away from the edges of the casing to the hole until the hole is not more than 1½ inches long. When the hole is placed low and the slag permitted to flow through the heat after it is opened the plug is made of loam or molding sand mixed with a little blacking to make it porous when heated, and the plug is placed in the hole on the inside flush with the lining. No tap hole is made through the plug when placed in this way, and when it is desired to tap slag a hole is cut through it with a sharp pointed tap bar. This material does not bake hard, and the entire plug may be cut out when necessary.

Slag chills more rapidly in a tap hole than iron, and is more difficult to tap or draw from a cupola, and when the slag hole is not properly arranged it cannot be drawn at all. If the tap hole is made small and long the slag chills in the hole and it is difficult to open the hole or keep it open. When the lining is very thick it must be cut away and the hole made large inside of the front, or the slag will chill in the lining the same as it might in the hole in the front. The hole in the lining can be made 6 or 8 inches diameter without injuring the lining, and a hole of this size will admit a sufficient quantity of slag to the tap hole to prevent it chilling. There is never any difficulty from the slag chilling when the front and tap hole are placed flush with the inside of the lining, for the slag is kept hot and fluid in the cupola, and may be drawn off whenever there is a sufficient quantity in the cupola to flow from it. It is therefore better to cut away the casing and lining, and place the front flush with the inside of the lining.

I shall have more to say about slag holes when considering the working of very small cupolas.

Slag Spout.

The slag spout is generally made with a round, flat bottom, and from 10 to 12 inches wide and 2 to 3 inches deep; but in many cases a flat plate is used in place of a spout, and it answers the purpose equally as well. The spout or plate extends from the slag hole to the bottom plate or a few inches below it, and is placed almost perpendicular. It is designed to carry the slag away from the cupola, so it will fall clear of the casing and bottom plate to the floor. The spout is placed at so great an angle that it is difficult to keep a lining or daubing upon it, and it is almost as economical to cast the spout of a good thickness, and when it is cracked by the heat and becomes worthless replace it by a new one, as it is to line it. When the spout is lined the same material is used for lining as is used for lining the iron spout, and it is made up in about the same way.

ODD PLATES.

"The New Process Cook Book and Catalogue" is the title of a volume of 250 pages, handsomely bound in white, which reaches us with the compliments of the Standard Lighting Company, Cleveland, Ohio,. As indicated by the name, it is made up of a large number of recipes for the housewife, arranged and classified in such a way as to facilitate reference and add not a little to the value of the publication. The volume may be said to consist of two parts, the first being devoted to illustrations and descriptions of the New Process goods made by the Standard Lighting Company. In connection therewith is also presented some reference to furnaces, torches, street lights, broilers, lamps, &c. There is a comprehensive index arranged alphebetically under the variety of food, and also alphabetically under each head. At the close of the volume attention is given to family ailments and simple remedies, table of measures and weights, interest rules, postal information, and a little more than a page of matter entitled "Law in Brief." There are also several blank pages for additional recipes. On the cover the price of the cook book is given as $1.50.

One of the most unique calendars for the new year which has reached us is that presented with the compliments of White, Warner & Co., Taunton, Mass. It is in the form of a pamphlet, made up of pages of heavy paper, the outer edges being cut in such a way as to conform to one side of the picture of a ship under full sail which adorns the front cover. According to the statements contained, the calendar was designed at the studios in England and printed by the Rafolith plates at the Fine Art Works in Saxony. A number of pages are adorned with colored designs of a varied nature, accompanied by extracts from well-known authors. The calendar for the year is divided into quarters, three months being given on a page. The covers are embellished with exquisitely colored marine views, while the binding is a golden cord stitched through the back and tied at the center.

The Union Foundry & Stove Works, at Frederick, Md., have been destroyed by fire. The loss is estimated at $15,000; insured for $3400.

The Bridge & Beach Mfg. Company of St. Louis, Mo., closed their works on the last day of January, preparatory to the erection of a new foundry, work on which is now under way. From a local paper we learn that the present four-story foundry building was erected by the late Hudson E. Bridge in the year 1848. On the levee front wall there is cut in one of the bricks a mark with the date 1858, giving the high water mark during the disastrous flood of 36 years ago and showing the water on the levee sidewalk to have been 4 feet deep. On another brick is the mark for 1892, showing a depth of 30 inches on the sidewalk. It is stated that these two bricks will be carefully removed and replaced in the wall of the new building at the exact hight they were in the original structure. In the reconstruction the levee molding floor will be raised 8 feet, making the entire block on a level with Main street. In making these changes the company probably regret most of all parting with their old walking beam engine, which has done such good service since it was erected by the old firm of Gaty & McCune in 1849. It is to be replaced by a modern 200 horse-power Corliss engine. According to the St. Louis *Republic* the new foundry building will be an immense affair, seven stories in hight, and extending from Main street to the levee. It will be equipped throughout with the latest improved machinery of the most approved design. The sixth and seventh floors will be used as mounting shops and other floors for starage. It is expected that the new plant will be in operation by May 1.

The Kohler Furnace & Steam Heating Company of 93 Union street, Boston, Mass., have issued a descriptive catalogue of the Kohler hot air furnace and combination heating apparatus patented and manufactured by them. In offering the volume to the trade the company state it is not their intention to dwell upon the necessity of heat for our comfortable existence, nor to discuss the question of the comparative merits of steam, hot water or hot air heating. The real question at issue is healthful comfort, and in an endeavor to define more clearly how such an end may be attained the company invite a careful perusal of the pages of the catalogue. Their apparatus is described at considerable length and illustrations presented showing the heaters in broken view, clearly indicating the interior arrangement of parts. A large portion of the pamphlet is taken up with testimonial letters from those who have used their furnaces and heating apparatus.

We are indebted to the Dippo Mfg. Company of Chagrin Falls, Ohio, for copies of pamphlets relating to the Ferrosteel ranges, which they manufacture. The first pamphlet presents a detailed description of these goods, together with illustrations of the several varieties in which the goods are made. There are also given tables showing various sizes, with dimensions of top and oven, as well as code words and list prices. The second pamphlet or catalogue calls attention to the Ferrosteel B ranges, which are the latest goods the company have placed upon the market. These are rich and attractive in their ornamental features, and are constructed in such a way as to give satisfactory results in operation. They are referred to as being of a high order of merit, and as proving popular with the trade wherever introduced. The company state that their plant is new and perfectly equipped.

The Evansville Stove Works filed articles of incorporation Tuesday, February 6, with the Recorder at Evansville, Ind. The capital stock is said to be $35,000 and the object of the corporation is to manufacture and sell stoves, hollow ware, tinware, &c. The directors for the first year are Henry S. Kahn, A. H. Kahn and Charles F. Meyerhoff.

The Richmond Stove Company, Norwich, Conn., distribute as a reminder to the trade a burnished peacock made of iron finished handsomely in nickel. This bird of gorgeous plumage is so disposed, with his tail feathers spread about him, as to form a shallow dish serviceable for an ash receiver or any similar purpose. It is a light and clean cut casting and is a worthy souvenir of these well known manufacturers of stoves and steam and hot water heaters.

Palermo Mica Company have forwarded to their New York office, 27 Peck slip, the cabinet, with specimens of mica it contained, which was on exhibition at the Columbian Fair, Chicago. All who are interested in a display of this character are invited to inspect it. There are three fine large slabs of mica in a perfectly natural state, just as they were taken from the company's mine in New Hampshire. One of these measures at the extremes 37 x 22 inches, weight 84 pounds. The company refer to it as the largest good piece ever mined. There are two or three other notable examples of mica in its natural state mounted in frames and hung on the walls. One unique piece of cleaned mica has been framed in oak as a pane of glass would be. It is exceptionally fine in quality and 20 x 12 inches in dimensions, rectangular in shape. There

are besides a number of packages, in various sizes, of cleaned mica in commercial shape for many purposes, including stove and electrical work, odd shapes for canopies and protectors for lamp shades, &c.; also ground mica for lubricating, for paint manufacturers and makers of wall papers, scene painting, &c. Among the minerals taken from the same mine are specimens of apatite, quartz, crystals, crystallized spar, crystallized quartz and beryls. The gem of the collection is a piece of dendrite, with a figure in it formed of some foreign substance which strongly resembles a fern.

The Kelsey Furnace Company of 339 West Fayette street, Syracuse, N. Y., report the outlook for the coming year as very encouraging, and state that their agents now on the road have secured a number of good orders with specifications for shipment in the near future. The company add that they are shipping a goodly number of sample orders at the present time. They are bringing out another size of their furnace, which is provided with a 21-inch fire pot. They have recently placed in the rooms of the Builders' Exchange, both at Brooklyn and Philadelphia, one of their corrugated furnaces, which was done for the benefit of those interested in and about the cities named, who have written asking the company for catalogues and where they can examine their goods.

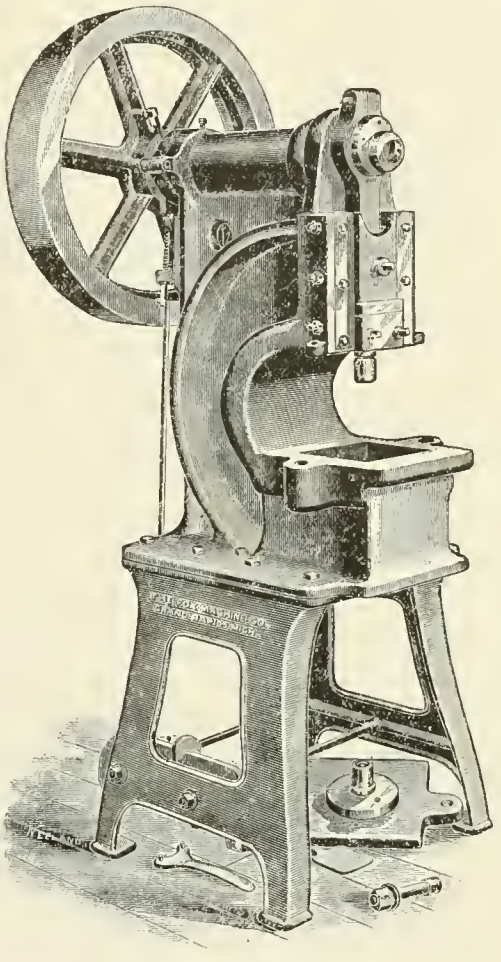
Advices from Ohio are to the effect that all the stove works in Wheeling, Bridgeport, Bellaire and Martin's Ferry are closed down. The men have been asked to accept a cut in wages amounting to about 10 per cent., which they have refused to do. Demand for stoves and hollow ware is very light, and the managers are not anxious to reaume even at a reduction.

At the annual meeting, in Keokuk, Iowa, of the stock holders of the Keokuk Stove Works, held recently, the following officers were elected: H. C. Huiskamp, president; Dr. L. C. Ingersoll, vice-president, and Charles Narrley, secretary and tressurer. The following Board of Directors was elected: H. C. Huiskamp, Dr. L. C. Ingersoll, I. M. Walters, Chas. Narrley, all of Keokuk, and C. H. Castle of Quincy, Ill.

The Grand Rapids Vapor Stove Company of Grand Rapids, Mich., are the assignees of a patent granted last month to Charles H. Child of that place for a vaporizer for use in connection with gasoline stoves. The object of the invention is to provide means whereby the vaporizing chamber will be maintained at a higher temperature and rendered more effective than usual, and consists of a hood or deflector so placed above the burner as to deflect the flame and throw the heat down upon the vaporizing plate. The burner employed has the form of a truncated cone, with radiated openings around the base and top for the escape of the combustible mixture. The annular hood or deflector is made in the same piece with the cap of the burner, and is connected thereto by means of radial bars, which leaves a space between the cap and hoods. The arrangement is such that the current of combustible mixture escaping from the upper openings of the burner comes in contact with the downwardly inclined inward surface of the hood and carries a current of air with it through the annular space between the cap and hood. The inventor states that as the hood is heated by the flame the mixture is also raised to a high temperature, giving a perfect combustion with a high proportion of air.

No. 3 Fox Punching Press.

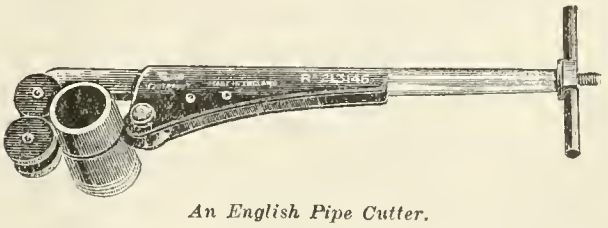
We show in the accompanying illustration a general view of the No. 3 Fox punching press, made by the Fox Machine Company, Grand Rapids, Mich. In building this tool the company aim at large space for adjustment between the slide and the bed and great depth from the center of the slide to the back of the throat, so as to make it capable of handling a large variety of work. They also point out that the metal has been disposed to the best advantage, giving strength with comparative lightness. In the present design they do not put on as large a fly wheel as ordinarily used, but compensate for the reduced weight by running it about twice as fast, thus getting more power and a quicker acting press. The opening in the bed is 8 x 9 inches, the distance from back to center of slide 8½ inches and the extreme distance from bed to bottom of slide 8½ inches. The stroke of the press, or motion of the slide, is $1\frac{3}{16}$ inches, or can be made any distance from 1 to 2 inches. The total weight of the machine is 2000 pounds and the floor space occupied 28 x 36 inches.



No. 3 Fox Punching Press.

An English Pipe Cutter.

In a recent number of the London *Ironmonger* there is illustrated an invention of Thomas R. Ellin of the Footprint Works, Sheffield, and which is known as the Footprint tube cutter. It is said to operate with a minimum of labor, as the material to be cut rests on anti-friction rollers set so that the burr thrown up by the cutter wheel does not touch them. All the working parts are of steel, interchangeable, and the cutter wheel is very large and set between steel sides, which can be tightened by a set screw to take up lost motion.



An English Pipe Cutter.

J. H. Shelly, with headquarters at Dallas, Texas, has taken entire charge of the affairs of the Peninsular Stove Company in that section. He advises the home office that the prospects in Texas are much better at this time than might be expected, and has received substantial encouragement in the way of several fine orders for immediate shipment. Stocks generally are said to be low, and stoves are needed right away. The better and more desirable trade are, as usual, looking for the best goods on the market.

TRADE REPORT.

The Iron Market.

Taken all together the news of the week may be summarized as being encouraging in a modest way. The volume of business is increasing, but the fact that prices in many lines are lower than ever shows conclusively that there are only too many mills desperately hungry for work.

Along the whole line of rolling mill products, with the exception of Wire, the tremendous competition continues and lower prices have been made than ever before. Rumors are being circulated that the most conspicuous of the Pittsburgh mills is withdrawing, but the happenings in the markets do not bear out that statement.

The situation in Foundry Pig is somewhat peculiar. Low Lake Ore and Connellsville Coke is enabling Western furnaces to crowd back the Southern producers from the Central Western markets and resales of Southern Pig from second hands at less than $6.50, Birmingham, for No. 4 Foundry (Gray Forge) are giving the primary markets for Southern Iron an appearance of weakness.

In New England, however, there have cropped up during the last week many evidences of a desire to contract far ahead. The majority of the largest transactions there have been captured at low prices by Virginia furnaces.

If something final were only done in Washington at once, the feeling would improve. Unfortunately, the low price of wheat, diminishing as it does the purchasing power of the farmers, is looming up as a new disturbing factor.

Pig Iron.—While agents of standard brands of Northern Iron have little new business to report, it is clear that Southern furnaces, and particularly those of Virginia, have succeeded in inducing a number of buyers in New England to cover their requirements for the current year. A radiator manufacturer in Connecticut has purchased 5000 tons to cover this year's requirements. A manufacturer of valves in Boston has covered his wants for half the year and is in the market for the other half. Two Boston stove foundries have purchased a total of 6000 to 8000 tons, all this business having been done on the basis of $12 @ $12.50 for No. 2 Foundry. The fact that these buyers have taken hold is regarded as a proof that some consumers at least are convinced that the bottom has been reached. Stocks in the hands of founders are notoriously lower than they have ever been, so that any spread of the buying movement is regarded as likely to bring about a recovery in values. The report from Louisville that Foundry Forge has sold at less than $6.50 is explained by the fact that during the panic when Southern furnace paper sold repeatedly at 24 % discount some of the companies paid their creditors with Pig Iron. It is this Iron which has been cropping up in the market from time to time and has sold at the record breaking prices. We quote standard brands $13 @ $13 50 for No. 1; $12.50 @ $13 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $13.50 for No. 1; $11.75 @ $12.50 for No. 2; $11.50 @ $12 for No. 3; $11.50 @ $11.75 for No. 2 Soft, and $12 @ $12.50 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10.75 @ $11.25.

All that can be said in regard to the Philadelphia Pig Iron market is that sales are made with less difficulty, and that prices are maintained. Options that were given last month have nearly all been accepted, and while makers have not arrived at a point at which they refuse business at the old quotations, they are just as well satisfied to accept small orders for prompt delivery as large orders for long delivery. It is not easy to give exact quotations, but in general terms $11 @ $11.50, delivered, is about an average for good No. 3, $12.50 @ $12.75 for No. 2x, and $13 @ $13.50 for No. 1x. Some brands bring a little more, some can be had for a little less, all depends on the circumstances governing each particular transaction. At interior points, such as Harrisburg and York, lower figures prevail, the range for all deliveries at seaboard being about as follows:

No. 1 Foundry	$13.00 @ $13.50
No. 2 Foundry	12.50 @ 13.00

In Chicago the volume of business in local Coke is of good proportions, but no specially large transactions have taken place the past week. The market for such Iron, however, is widening, and inquiries are being received from localities in which Southern has for several years held undisputed sway. Our quotations on local Coke are based on small quantities, which at present constitute the great majority of transactions, but orders of some size are placed on an independent basis, on which the price is the subject of negotiations and consequently may be considerably lower. Only small orders are reported by sellers of Southern Coke. Lake Superior Charcoal continues quiet. Quotations are given as follows, for cash:

Lake Superior Charcoal	$15.30 @ $15.50
Local Coke Foundry, No. 1	12.50 @ 13.00
Local Coke Foundry, No. 2	12.00 @ 12.50
Local Coke Foundry, No. 3	11.75 @ 12.00
Local Scotch	13.00 @ 13.50
Ohio Strong Softeners No. 1	15.00 @ 15.50
Southern Silvery, No. 1	..... @ 13.75
Southern Silvery, No. 2	..... @ 13.25
Southern Coke, No. 2	11.50 @ 11.65
Southern Coke, No. 3	11.00 @ 11.50
Southern, No. 1, Soft	11.50 @ 11.65
Southern, No. 2, Soft	11.00 @ 11.50
Tennessee Charcoal, No. 1	16.00 @ 16.50
Tennessee Charcoal, No. 2	..... @ 15.00
Alabama Car Wheel	18.00 @ 18.50
Jackson County Silvery	16.00 @ 16.50
Other Ohio Silvery	15.00 @ 15.50

The demand for Foundry Iron in the Pittsburgh district is light, and prices show no inclination to improve. We note a sale of 200 tons of No. 2 Foundry at a price equal to about $11, delivered. Taken as a whole, the Pig Iron market is better than it was a month ago, but there remains plenty of room for further improvement. We repeat former quotations, as follows:

No. 1 Foundry	$11.75 @ $12.00, cash.
No. 2 Foundry	10.75 @ 11.00 "

While the volume of business in Pig Iron has been small in some of the Southern markets during the week, yet there have been some moderate lots sold in others, and at a lower price for Foundry Iron, which sets the pace for the trade, although it is claimed that the low prices that were made were exceptional and would not again be accepted. Southern Irons are about 25¢ ℔ ton lower than they have before been quoted. We give revised quotations for some grades of Northern Iron, but there is not much doing on them, and Charcoal Iron is very quiet. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$11.25 @ $11.50
Southern Coke, No. 2	10.25 @ 10.50
Southern Coke, No. 3	9.75 @ 10.00
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.25 @ 14.50
Lake Superior Coke, No. 1	13.00 @ 13.50
Lake Superior Coke, No. 2	12.00 @ 12.25
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.50 @ 14.00
Tennessee Charcoal, No. 2	12.50 @ 13.00
Standard Southern Car Wheel	16.75 @ 17.75
Lake Superior Car Wheel and Malleable	16.50 @ 17.00

Metal Market.

Pig Tin.—The level of prices has gone somewhat lower. Actual Tin has been offered and sold at 19.55¢ @ 19.60¢, net cash, prompt or near future delivery; offers to sell June delivery at a remarkably wide discount and other offers at as low as 17.75¢ @ 18¢ for deliveries toward the close of the year were quite as feebly responded to. Ordinarily there would seem to be something of incentive to speculative venture in this wide range of prices, but the inducements have thus far proven unattractive. The explanation is offered that consumers are extremely conservative, that outside speculators keep far on the outside in view of the compli-

cated condition of affairs and that the insiders are doing very little, for reasons best known to themselves. Hence a ragged sort of market and more than usual uncertainty pending solution of the problems that Tariff uncertainties make more than usually difficult to contend against. That there is enough Tin to meet current wants is plain. That there is a surplus seems to be quite probable, despite statistics tending to the contrary. Jobbers report a very moderate consumptive demand. Prices for small lots have been marked down to 21½¢ for Banca and 20½¢ @ 21¢ for Straits Pig.

Copper.—Not the least difficulty has been experienced in filling orders for Lake Superior Ingot at 9¾¢, prompt or near future delivery. Buyers, however, have been extremely few and far between. Well timed offers at 9⅝¢ for early deliveries were quite as ineffective in leading to business, and bids above 9½¢ have been exceedingly difficult to draw out. Other varieties have not fared quite as poorly, but they are slow of sale nevertheless, and 9½¢ for Electrolytic and 9¼¢ for ordinary casting stock are full rates where other than jobbing lots may be involved. A slightly improved demand has been noted during the past week from consumers, but sales comprise, as a rule, little beyond moderate quantities for immediate requirements. Jobbers are inclined to give concessions on small lots for spot cash, and prices rule generally from ¼¢ to ½¢ lower for all varieties.

Sheet Copper.—Sales of Cornice Copper continue very light. Cornice makers are by no means busy, in the best of times, at this season of the year. At the present time the general depression in the building trade, together with unfavorable weather, combine to reduce their work and consequent requirements in this line to a minimum. Prices on Sheet Copper incline to weakness, though nominally unchanged.

Pig Lead.—The market is weaker. It is easier to buy at 3.30¢ here and very difficult to secure bids above 3.20¢ here for prompt or future deliveries. The speculative interest seems to have enough, and consumers in this quarter are doing nothing to speak of beyond merely routine buying. Hence a dull condition of affairs and general hesitancy that effectually operates to check the intended influence of restricted production reported from some quarters of late. The current demand for retail quantities of Pig Lead continues to be of the slowest, and jobbers are apt to take orders at prices materially lower than the quoted rates. For jobbing quantities of American Pig 3⅞¢ @ 4¢ is quoted as the outside price. Little or nothing beyond a feeble routine business is being done in Manufactured Lead, notwithstanding the recent decline in prices.

Spelter.—Prices were carried up to as high as 4¢. There was no business. The maneuver seemed to have been purely speculative, with the backing of advices to the effect that an agreement has been made to restrict production with a view to turning prices for the better. In other words, it was a speculative move that is distrusted at present, since offers have very recently been made to sell at 3.85¢ @ 3.90¢ for carload lots, delivered here or at common points, while quotations from the West were relatively a great deal higher. It is still possible to obtain lots of a ton or so at 4¢ from store, even while carload lots are selling at that figure.

Nickel.—The range of quotations is 45¢ @ 50¢ Sales have been made latterly at 45¢, and that is doubtless the truest representation of actual market value.

Tin Plate.—No improvement has taken place in sales of any large amount for either prompt or future deliveries. Yet the retail market shows a more active movement to have developed during the week. Inquiries are more numerous and so are orders. Although the latter are generally confined to small quantities for prompt delivery, yet they are more frequently duplicated than has been the case of late, and make in the aggregate a fairly lively business for jobbers. The little spurt is attributed to the fact that consumers, as a rule, allowed their supplies to run out before replenishing them, and this they are only doing to the extent of their immediate requirements. Canners and can makers are rather more in evidence as purchasers, and this class of consumers are the most active customers. Business is, however, decidedly slower than usual, even at the present season, and nothing more than a hand to mouth trade is looked for until such time as the tariff question is settled. Stocks in the hands of importers are unusually low, but a good stock of imported Plates is kept in bond by many houses and drawn on piecemeal as required. Jobbers say that it was never more difficult to fill an order for any assortment of Plates, or for special kinds. Much "hunting around" among the trade is found necessary to make up such orders. There is little doing in Roofing Plates at present. Prices are soft, except for certain lines of light Cokes, and a reduction of 2½¢ @ 5¢ a box is not infrequently conceded.

A London cable to *The Iron Age* of February 14 reports the position of Tin Plates in the English market as unchanged. There is more inquiry, but prices are invariably low. The course of the Tariff bill in the United States has given a more hopeful feeling to British manufacturers. Fair orders have been placed for all sizes for both American and Russian account, but purchases are still below the average for the season, and there is no improvement in prices. Liverpool prices are quoted as follows:

IC Charcoal, Alloway grade	12/3 @ 12/9
IC Bessemer Steel, Coke finish	11/ @ ....
IC Siemens " " "	11/3 @ ....
IC Coke, B. V. grade, 14 x 20	11/ @ ....
Charcoal Terne, Dean grade	10/6 @ ....

Sheet Iron.—Black Sheets, except those of light gauge for tinning purposes, are little more than a drug in the market, the requirements of consumers appearing to be filled for the moment. Prices are demoralized and decidedly in buyers' favor. The demand for Galvanized Iron is a little better, although little is doing in cornice work, and the recent severe weather has set back construction work. The recent rise in the price of Spelter may, it is thought, strengthen the market for Galvanized Iron. Stocks of both Black and Galvanized Iron are fairly abundant.

Chicago Report.

Scrap.—There is no change in the market, which continues dull. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	7.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—The demand has not improved. Efforts are being made to maintain the regular schedule rates. Carload lots of 12 net tons or over are nominally quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

A. O. SCHOONMAKER, 158 William street, New York, issues a four-page circular directing attention to solid Sheet Mica for electrical purposes.

CONDITION OF THE

Hardware Trade.

TRADE IN JANUARY was undoubtedly much more satisfactory than for a number of months, and was, perhaps, on the whole, nearly up to the usual average for that month. It was, however, somewhat uneven, and with some houses the volume of business was much more satisfactory than with others. There is still a continued improvement to be noted, and the volume of business is growing. While trade is gradually assuming a more normal type it still, however, unquestionably feels the effect of the contraction and distrust of the past, and merchants are still placing their orders with caution and care. Orders from the small trade are referred to as covering a varied line of goods, in which seasonable specialties have a prominent place. Such orders indicate from their make up that stocks in nearly all lines are somewhat depleted. There is a disposition on the part of buyers, especially in the larger houses, to place orders for future rather than immediate delivery. Prices are without important change, though it is to be noted that on some staple goods the market is decidedly firmer than a few weeks ago. As a result of the business conditions which have existed for some time manufacturers in many lines have much less than the usual quantity of goods on hand, and it is not unlikely than if an active demand should set in more or less of scarcity would be developed. This is thought not unlikely to occur in Wire Cloth and Poultry Netting, lines in which there has of late been a good deal of active competition between the manufacturers. The prices on general Hardware continue on the whole fairly well maintained, but concessions are made somewhat more freely than heretofore, with a view to obtainiug orders. The financial condition is on the whole fairly satisfactory, and there is comparatively little complaint in regard to collections. There is also evidence that capital is beginning to seek investment in new enterprises, and this, with a more general resumption of work in mills and factories, cannot help having a good effect upon trade in general.

Advices from Chicago.—The volume of business steadily grows. In fact, there is more of a disposition to buy than jobbers generally feel willing to gratify. They are tightening the reins on those who have old bills hanging, and insist that such accounts should be settled before new obligations of any considerable amount are incurred. Although collections are good when everything is considered, yet there are an unusual number of merchants in arrears on last year who were grauted time during the financial stringency, and who now think still more time can be taken. Buyers whose credit is good are treated very differently. They are urged to load up and are advised that this is a good time to lay in stocks, especially of any articles in which the material constitutes the greater part of its value. Much stress is laid on the recent advance in Steel Billets, which is expected by the shrewdest jobbers to have a decided effect before long on a wide range of products. A recent interesting feature of this market has been the number of new stocks bought by parties in numerous places in the Northwest who believe that this is a good time to start in business. The heavy demand continues for all kinds of staple goods and gives no sign of an early abatement. Jobbers of heavy Hardware are not doing as much business as they would like and considerable complaint is heard among them of the backwardness of the trade. Orders are fairly numerous, but they are small, and the very low prices now prevailing make daily sales in dollars and cents seem discouragingly light.

Notes on Prices.

Wire Nails.—In sympathy with the advance noted below in Barb Wire, the prices of Wire Nails are higher, and the market is now represented by the quotation of $1.10 for carload lots at factory, with the usual advance for small lots. The manufacturers are full of orders, the trade both large and small having been purchasing freely since the opening of the year, and the tone of the market is firm, with some prospect of a further advance in price.

Advices from Chicago.—The change which has recently occurred in the Wire Nail trade is one of the most extraordinary events in the history of the business. It is but a few days since manufacturers were urgently soliciting orders and offering very low prices, which buyers seemed afraid to take up. Now the buyers are soliciting manufacturers to accept more business and are urgently calling for earlier shipments on orders they have placed. The factories are overflowing with work, some being well sold up to May, and yet plenty of buyers are turning up who have not covered their wants. Manufacturers' prices are about $1.20, Chicago, but higher rates are imminent because raw material is scarce and dearer. Wire Rods are hard to get, the mills being well sold up far into the future. The last cloud was lifted from the market a few days since, when all quotations were withdrawn by the then cheapest Wire Nail concern. What has happened in this trade is taken as an indication of what may be expected when buyers begin to stock up in other lines. Jobbers quote carloads and mixed carloads at $1.20 and small lots at $1.25

Cut Nails.—There is little change to note in the Cut Nail market and prices continue as before. The market in the East is represented by the manufacturers' quotation of $1.05 for carload lots on dock, New York; and the Western market by the quotation of $1 to $1.05 at mill. In sympathy with the improved condition of Wire Nails the Cut Nail market has, however, a somewhat better tone.

Advices from Chicago.—Manufacturers of Cut Steel Nails have not enjoyed as heavy an increase in trade as the Wire Nail people, but report a considerably larger movement, with prices still quoted on the basis of $1.05, Chicago, for 60-cent average. Jobbers sell small lots from stock at $1.15 to $1.20.

Barb Wire.—The improved condition of the Barb Wire market referred to in our last issue still continues and higher prices are now quoted by all the manufacturers. The market is now represented by the quotation of $2.15 for carload lots of Galvanized Four Point at Pittsburgh, $2.20 at Cleveland, $2.25 at Cincinnati or Allentown, and $2.35 at New York. The understanding between the manufacturers in regard to these advanced prices was reached in view of the fact that the demand has been heavy and most of the mills are well filled with orders. The expectation of a continued heavy demand during the season and the advance in Billets also influenced their decision. In this condition of things the market is decidedly firmer and manufacturers intimate that a further advance is not unlikely.

Advices from Chicago.—The movement in Barb Wire parallels that in Wire Nails. Manufacturers are doing a heavy business and the recent advance to $2.25, Chicago, for Galvanized has stimulated trade rather than checked it. Special brands of Wire are now firm at $2.40 and moving freely at that price. Jobbers report a much better business in this line and have advanced their quotations on carloads and mixed carloads to $2 for Painted and $2.40 for Galvanized, with 5 cents advance for small lots.

Rope.—There has been within the past few weeks no change in the current prices for Rope and the market is firmer than for some time. The manufacturers refer to the decline in prices as having been checked. The demand is, however, light.

Sample Holder.—Thompson's Sample Holder, manufactured by Massey & Thompson, Monroe City, Mo., is now sold at the following reduced prices: $7 per gross, assorted, four sizes; 65 cents per dozen in quantities less than half gross.

Cash Register.—The Improved Sun No. 10 Cash Register, manufactured by the Sun Mfg. Company, Greenfield, Ohio, is sold at $60, f.o.b. factory.

Climax Ratchet Stock.—Clarence M. Kemp is putting this device on the market. It is sold from the following list, which is subject to a discount of 25 per cent. to the trade:

No. 1, threads ¼ to 1 inch pipe. takes die 2 or 2½ inches square.....$10.00
No. 2, threads 1¼ to 2 inch pipe, takes die 2 or 2½ inches square..... 17.00

Shot.—The active competition between the manufacturers of Shot to which we referred in our last issue is evidenced by the reduced prices given below, which are announced under date February 12. Terms 30 days, or 2 per cent. discount for cash in ten days from date of invoice :

	Per bag.
Drop Shot, sizes smaller than B, 25 pound bags	$1.15
Drop Shot, sizes smaller than B, 5-pound bags	.35
Drop Shot, B and larger sizes, 25-pound bags	1.40
Drop Shot, B and larger sizes, 5-pound bags	.40
Buck and Chilled Shot, 25 pound bags	1.40
" " " " 5-pound "	.40
Dust Shot, 25-pound bags	2.00
" " 5-pound "	.45

In lots of 2000 pounds and upward taken at one time a discount of 5 cents per bag (25 pounds) will be allowed, together with a special discount of 2½ per cent.

The Bernard Pliers.—The following are the list prices of the Bernard Pliers, which are manufactured by Julius Berbecker & Co., 65 Duane street, New York. The list is subject to a discount of 30 per cent.:

Electric Plier.....$30 per dozen.

Flat Nose Plier.

	4½	5½	6½	Extra heavy. 7½ inch.
	$7.00	9.00	11.50	15.00 per dozen.
Extra Jaws	2.25	2.50	2.75	4.25 "

Round Nose Plier.

	4½	5½	6½ inch.
	$7.00	9.00	11.50 per dozen.
Extra Jaws.....	2.25	2.50	2.75 "

Cutting Plier.

	4½	5½	6½	Extra heavy. 7½ inch.
Per dozen....	$11.50	14.50	17.50	24.00
Extra Cutting Jaws.....	4.50	5.00	5.50	7.00
Extra Cutting Blades... ...	2.75	3.00	3.25	4.00
Extra Center Screws.....	.25	.30	.35	.40
Extra Bolts and Nuts.....	.45	.50	.55	.60

Gas Plier.

7 inch.....$12.00 per dozen
Extra Jaws..... 3.75 "

Chandelier Plier.

	4½	5 inch.
	$8.50	9.50 per dozen.
Extra Jaws	2.50	2.75 "

Jewelers' Flat Nose Plier.

	3½	4	4½	5 inch.
	$7.50	8.50	9.50	10.50 per dozen.
Extra Jaws	2.00	2.25	2.50	2.75 "

Jewelers' Round Nose Plier.

	4	4½ inch.
	$8.50	9.50 per dozen.
Extra Jaws.....	2.25	2.50 "

Jewelers' Cutting Plier.

	Per dozen.
Jewelers' Cutting Plier, 5 inch.....	$16.00
Extra Cutting Jaws.	5.25
" " Blades.....	3.00
" Center Screws.....	.30
" Bolts and Nuts.....	.50

Sewing Machine Plier.

	Per dozen.
Sewing Machine Plier.....	$12.00
Extra Jaws..	3.00
" Knives.....	1 50
" Bolts and Nuts.....	.45
" Knife Screws.....	.25
" Punches.....	.50

Step and Extension Ladder.—The combined Step and Extension Ladder manufactured by Priestly Express Wagon & Sleigh Company, Grand Rapids, Mich., for whom Horace F. Sise, 114 Chambers street, New York, is agent, an illustration of which appeared in *The Iron Age* February 8, 1894, is sold at a discount of 35 per cent. from the following list:

Length.	Extending to	Each.
4 foot	7 feet	$1.75
5 "	9 "	2.00
6 "	11 "	2.25
7 "	13 "	2.75
8 "	15 "	3.00
9 "	17 "	3.50
10 "	19 "	4.00
12 "	23 "	4.50

Old Metals.—The market for Old Metals shows as yet no decided improvement. For some kinds of Scrap Iron, however, there is said to be a rather livelier demand, but prices continue low. The following quotations are about dealers' prices for New York delivery:

Heavy Copper	℔ lb		7¢
Light and Tinned Copper	℔ lb		6¢
Heavy Brass	℔ lb		5¢
Light Brass	℔ lb		4¢
Lead	℔ lb		3¢
Tea Lead	℔ lb		2½¢
Zinc	℔ lb		2¼¢
No. 1 Pewter	℔ lb		13¢
No. 2 Pewter	℔ lb		6¢
Wrought Scrap Iron....℔ gross ton		$7.00 @	$8.00
Heavy Cast Scrap.....℔ gross ton		7.00 @	8.00
Stove Plate Scrap.....℔ gross ton		4.00 @	5.00
Burnt Iron, ℔ gross ton...		2.50 @	3.00

Old Rags, Paper, &c.—The market for these materials gives a little indication of improvement, and prices continue weak. Quotations for New York delivery are nominally as follows:

No. 1 White Rags	℔ lb	3¼ @	3½¢
No. 2 White Rags	℔ lb	2¼ @	2½¢
Mixed Rags	℔ lb		¾¢
Blues and 3ds	℔ lb	1 @	1¼¢
Hard Sized White Shavings	℔ lb	2¼ @	2½¢
No.1 White Book Shavings	℔ lb	2 @	2⅛¢
No.2 White Book Shavings	℔ lb	1 @	1½¢
Light Book Shavings	℔ lb		¾¢
No. 1 Mixed Shavings	℔ lb	¾ @	1¢
No. 2 Mixed Shavings	℔ lb	½ @	¾¢
No. 1 Printed Books	℔ lb	1 @	1¼¢
Ordinary Mixed Books	℔ lb	½ @	¾¢
Newspapers	℔ lb	2-5 @	½¢
No. 1 Manila Paper	℔ lb	@	1½¢
No. 2 Manila Paper	℔ lb	⅝ @	¾¢
Bogus Paper	℔ lb		½¢
Common Paper	℔ lb		⅝¢
Straw Chips	℔ lb		½¢
Binders' Clippings	℔ lb	½ @	⅝¢
Jute Butts	℔ lb	1⅞ @	2 ¢
No. 1 Jute Bagging	℔ lb	1 @	1¼¢
Mixed Bagging	℔ lb	¾ @	1 ¢
No. 2 Bagging	℔ lb	½ @	¾¢
Hemp Twine	℔ lb	2 @	2½¢
Manila Rope	℔ lb	2¼ @	2⅝¢
Jute Rope	℔ lb	1½ @	1¾¢
Mixed Rope	℔ lb	¾ @	⅞¢

Old Rubber.—The market for this material remains very quiet. New York dealers' prices are nominally as follows:

Car Springs, ton lots, ℔ lb.	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb..	@	.03
Rubber shoes, less than carloads, ℔ lb.....0.02¼	@	.03⅛
Large Hose, ℔ ton.....	@	9.00
White Wringer Rolls, ℔ lb.	@	.04¼
White Syringes, ℔ lb.....	@	.05

On January 1, 1894, the copartnership composed of Albert R. Pritchard, John M. Milne (Charles D. Milne) and Millard F. Robeson, doing business under the style of the Rochester Stamping Works, Rochester, N. Y., was dissolved by mutual consent, the interest of John M. Milne (Charles D. Milne) being purchased by Millard F. Robeson. On the same date a new partnership was formed between Albert R. Pritchard, Millard F. Robeson and George W. Robeson, who will continue the business under the former style. They will pay all debts and collect all bills incurred by or owing to the Rochester Stamping Works.

Trade Notes.

The Aluminum Tea Kettles to which we made reference in a recent issue as being put on the market by the Griswold Mfg. Company of Erie, Pa., are at present made in size No. 8, which holds 6 quarts. The firm, however, are at work upon size No. 7, having a capacity of 5 quarts, and will soon have it ready.

"The History of a Lead Pencil," by Walton Day, is the title of an entertaining little pamphlet published by the Joseph Dixon Crucible Company, Jersey City, N. J. Of course the text refers very largely to the extensive line of Pencils manufactured by this well-known concern, but incidentally there is some interesting information given on the general subject. The inside covers, front and back, present companion pictures showing the countries from which the Lead Pencil materials are drawn. The former shows the graphite mills of the Joseph Dixon Crucible Company, at Ticonderoga, and the second is a scene in Florida, where they are rafting cedar logs to the Dixon mill at Crystal River. The back cover shows a view of the works in Jersey City.

The New Castle Steel & Tin Plate Company, New Castle, Pa., are manufacturers of the New Castle brands of guaranteed Tin and Terne Plates. In their advertisement elsewhere they direct attention to the fact that Lake Superior ores alone are used in making their steel, from which they roll their own black plate.

It is now reported that the Sheet mills of the Ellwood Steel Company, Ellwood, Pa., will not be moved to Cambridge, Ohio, to be added to the plant of the Cambridge Iron & Steel Company. The citizens of Cambridge made an effort to raise a bonus for the purpose, but the proceedings came to a sudden stop when it was announced that Ellwood parties had threatened to institute proceedings to enjoin the proprietors from moving the plant away from Ellwood. As a compensation for the disappointment, Cambridge is promised a tin plate plant in the near future. The Cambridge mills have been operated steadily during the crisis in trade and finance.

An advertisement on another page of Mortimer H. Cort, agent, formerly N. L. Cort & Co., 9 Burling Slip, New York, directs attention to Tin and Terne Plates, as well as Galvanized and Black Sheet Iron, Sheet Metals, &c.

R. M. Clough, Tolland, Conn., distributes circulars illustrating and describing some of his specialties. One circular relates to Clough's Hand Lever Punch. It is adapted to do any ordinary punching of sheet metal 3-16 inch and under, while iron ⅛ inch thick can be punched up to ½ inch diameter. Another tool is Clough's Improved Foot Press for sheet metal workers, which has a capacity for punching iron in the center of a sheet 36 inches square, and will take on a 5-inch pipe to punch holes 15 inches from the end.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

James Ahern, 280 Asylum street, Hartford, Conn., has the contract for the plumbing in the building of the Hartford City Gas Light Company. He will use 22 lavatories, 9 syphon jet water closets, 5 urinals, 2 slop sinks and a bathtub.

T. H. Langdon, Hartford, Conn., is remodeling the plumbing in the Cheney Building, using 54 Boston closets, and is doing the plumbing work in the residence of Mrs. H. W. Bowes, at Saybrook, Conn., where he will use a hot air engine, Boston closets, Mott's enameled baths, and a high grade of goods and work all through.

Thomas Oakes, 11 Haynes street, Hartford, Conn., erected the plumbing fixtures in the new Y. M. C. A. building, using 11 Nautilus water closets, and in the Free Library, using 7 Inodoro closets.

The Pequot boilers made by the Hopson & Chapin Mfg. Company, New London, Conn., have been used by James Ahern of Hartford, Conn., for heating the building of the Travelers' Insurance Company, the Hartford Hospital, the store of Henry Kohn, also his own residence and the residences of E. S. Goodrich, James A. Smith and Gen. L. A. Barber.

The Bosworth Heating Supply Company, Hartford, Conn., have installed hot water heating plants, using the American House Heater, in the residences of Chas. Herger, C. M. Holbrook and G. W. Richardson, and used the Plummer steam heater in the residences of A. P. Hyde and Mrs. T. W. Plympton and the Allen steam heater in the residences of F. W. Bakea and Dr. Howe.

At a recent meeting of the School Board of Northfield, Vt., it was voted to heat the High School building with steam, the apparatus to cost in the neighborhood of $1500.

T. P. Aitkin, Hartford, Conn., has the contract to do the plumbing in Goldschmidt & Hartman's new block in that city.

Trimble & Lutz, Wheeling, W. Va., completed a steam heating and plumbing job at the Spencer (W. Va.) Asylum. The work has just been inspected by B. H. Prather, Buffalo, N. Y., who reports that the air in all the buildings is changed by the apparatus every 15 minutes. The steam plant comprises six boilers, four pumps and three large fans, driven by separate engines. The steam plant is 400 feet away from the main buildings, the pipes being carried through a tunnel 6 x 8 feet in size.

The city of Houston, Texas, will receive bids up to March 6 for the erection of a High School building, in which the heating and ventilation, the plumbing and the gas fitting will be given as separate contracts.

A. F. Hussander is about completing a three story apartment house on Orchard street, near Wrightwood avenue, Chicago, Ill., which is to be heated by steam.

Lamson & Newman have designed a three-atory apartment house for George R. Allen, 746–748 Washington Boulevard, Chicago, which will be heated by steam.

The Board of Education of Detroit, Mich., will receive bids up to February 20 for the heating and ventilating apparatus, automatic flushing closets and urinals for two school buildings to be erected.

Hotel Champlain, at Sixty-sixth street and Champlain avenue, Chicago, will be remodeled, and will have a steam heating plant, gas fixtures and sanitary improvements.

Henry C. Wellington will erect at a cost of $30,000 a four-story apartment building at Thirty-fifth street and Wabash avenue, Chicago, that will be heated by steam.

Thirty thousand dollars will be invested by Thomas Coghlan in a three-story apartment house to be built at Macalister place and Vernon Park, Chicago, to be heated by steam.

Coones & Maher, Winona, Minn., have been awarded the contract for the plumbing, steam fitting and work of connecting the boilers at the power plant of the Rochester Electric Light Company.

At the official test recently made of the system of heating and ventilation installed by the Jennison Plumbing Company in the new Clarendon street school house, Fitchburg, Mass., the results obtained were unusually satisfactory. The tests showed that there was taken from outside the building, warmed and delivered without perceptible draft, an average amount of 51 cubic feet of fresh air per pupil each minute, whereas the State requirements only demand 30 feet. The system is so constructed that in mild weather the heating power can be reduced, with a corresponding saving in expense of fuel, while in the summer the same results in ventilation will be secured by running only a small fire in a heater separate from the main boiler.

The Walcott Hurlbut Company, 175–177 Lake street, Chicago, have received orders for the Eduction closet range for school buildings at Omaha, Neb., La Crosse, Sheboygan and Oshkosh, Wis.

The Kewanee Boiler Company, 96 Lake street, Chicago, have just furnished four No. 6½ Haxtun boilers for the flat building of Corse & Jeffery, Vincennes avenue, between Forty-sixth and Forty-seventh streets.

F. W. Lamb & Co., 258 Michigan street, Chicago, are to furnish the steam heating plant for the Equitable Building, Dearborn and Washington streets. Steam for heating will be taken from the Illinois National Bank Building, on the opposite side of the street.

The Model Heating Company of Philadelphia, New York and Chicago have been awarded contracts for heating by hot water two engine houses at Easton, Pa. The work will be installed by their Philadelphia office.

The Kelly & Jones Company, 141–143 First avenue, Pittsburgh, are to furnish the steam heating and power plant for the Westinghouse Company's shops, at Brinton Station, Pa. All of the buildings are of large size, the machine shop being 1000 feet in length.

The Baker & Smith Company, 193–197 Van Buren street, Chicago, are to supply a 54-inch tubular boiler and necessary radiation for the steam heating in St. Catharine's Academy, St. Catharine, Ky.

George Beaumont has designed for Parsons & Meyer a three-story apartment building on Emerald and Forty-fifth streets, Chicago, which will be heated by steam.

H. M. Hanson has completed plans for four three-story and basement apartment houses at Barry and Evanston avenues, Chicago, which are to be heated by steam.

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Metal and Miscellaneous Prices.

CHICAGO, FEBRUARY 15, 1894.

Tin—

Straits pigs..... .....22½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.60

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 lb	@ 5.25
IC, 14x20, 100 lb	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.80 @11.50
X, 10x 14, 14 x 20	@ 7.25
S.V. Grade. IC,10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25

Worcester Brand and equal.—

IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20	$7.00
IX, 10 x 14, 12 x 12, 14 x 20	9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal ,extra, IC, 14 x 20	7.25
Merlon, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.50
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A: IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland: IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood: IC, 20 x 28	$12.00
Juno: IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method: IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie: IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.
X, 14 x 56	29.50 16.50
XX, 14 x 56	32.50 18.20
X, 14 x 60	31.50 17.65
XX, 14 x 60	35.50 20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 6-10¢	3 2-10¢
17 to 20	₩ lb 2 7-10¢	3 3-10¢
21 to 24	₩ lb 2 8-10¢	3 4-10¢
25 and 26	₩ lb 2 9-10¢	3 5-10¢
27	₩ lb 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.

Patent Planished....₩ lb A, 10½¢; B, 9½¢ dls. 5%

Craig's Polished Sheet Steel.....8½¢

Galvanized.

Junlata or first quality.....dia.70&10%

Copper—

Ingot.

Lake.....11½¢ @ 12¢

Casting Branda.....10½¢ @ 11½¢

Sheet and Bolt.

Discount, 30%.

Copper Bottoms.

Discount, 30%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing.

(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ₩ 100 lb.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ lb
Bronze Tubing, 3¢ ₩ lb more than Brass	

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 lb casks.....4¾¢

300 lb casks.....5 ¢

Loose sheets.....5¼¢

Lead—

Soft Pig Lead.....3¾¢

Bar.....4¼¢

Pipe.....5½¢, dia. 10¢

Block Tin Pipe.....35¢

Sheet.....6¢, dis. 10%

Solder—

½@½.....12¾¢@13¼¢

Extrn Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢ @12¾¢

Hallett's.....11½¢@11¾¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	60%
1¼ and under, Galv	52½%
1½ and over, Plain	70%
1½ and over, Galv	60%
Boiler Tubes, list Oct. 24, 1892	70%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles: Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ lb, 2 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, B. Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Brown	₩ lb, 5½¢
" Ground in oil, Purple	₩ lb, 6 ¢
Linseed Oil, Boiled, in obls	52¢
Linseed Oil, Raw, in bbls	49¢
Mineral Paints	2@4¢
Orange Mineral	9¾¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, kegs	8¾@7¾¢
Sipe's Japan Oil, in bbls, ₩ gal	34¢
Spirits Turpentine, in bbls., ₩ gal	38¢
Asphaltum, Trinidad Refined, ₩ ton	$45
Tarred Felt, 1 Ply, ₩ 100 lb	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.70
Roofing Pitch, lb bbl. of 300 lb	$3.50

NEW YORK, FEBRUARY 16, 1894.

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal (guaranteed over 94% pure Alumiuum), in ton lots..... ₩ lb, $0.60

No 1 (guaranteed to be 98 % pure and over), in ton lots .....₩ lb .65

Lots less than 1 ton, 10¢ @ 12½¢ ₩ lb additional.

Antimony—

Cookson..... ₩ lb, 10¾¢

Hallett's..... ₩ lb, 10¼¢

Brass—

Planished.....net

Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per lb.	
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35	25@30%
Plain, to No. 20, above 3 inch	45	
Plain, 5-16 inch to No. 20	45	
Plain, ¼ inch	60	
Plain, 3-16 inch	1.00	
Plain, ⅛ inch	1.50	
Fancy Tubing to No. 20, inclu	43	

Copper and Bronze Tubing—

8¢ ₩ lb more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ₩ lb

Over 3½ to 5 inches inclusive....18¢ ₩ lb

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ₩ lb

Over 3½ to 5 inches inclusive....19¢ ₩ lb

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square*—

Galvanized.....60%

Galvanized, Locked Joints.....60%

Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢

Ansonia Grade Arizona.....10¼¢

Ansonia Grade Casting.....9¾¢

Planished......net

Sheet and Bolt......25&25&5%

Tubes — See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%

Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%

Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%

Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%

Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. American.	Cleaned
Nos. 10 to 16	₩ lb, 2.70	3 ¢	
Nos. 17 to 20	₩ lb. 2.80	3.10¢	
Nos. 21 to 24	₩ lb, 2.90	3.20¢	
Nos. 25 and 26	₩ lb. 3	3.30¢	
No. 27	₩ lb. 3.10	3.40¢	
No. 28	₩ lb, 3.15	3.50¢	
American B. B.	₩ lb, 4¢@4¼¢		

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11¾@12½¢

Patent Planished....₩ lb, A, 10¢; B, 9¢, 5%

Craig Polished Sheet Steel.....₩ lb, 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		70&5&10%
Nos. 17 to 22		
Nos. 23 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
Nos. 29 and 30		

Filter Joints—

Lee's.....33⅓%

Lead—

American Pig	3¾¢@4¢
Bar	4¼¢
Pipe	5¾¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	6¾¢, 20%

Old Lead in exchange, 2¾¢ ₩ lb.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6¼ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1¾
Red, Venetian, American	1¼ @ 2¾

Linseed Oil:
Raw, ₩ gal. .. @ .40
Boiled. .. @ .43

Spirits Turpentine:
In bbls. .. @ .82

Putty:
In barrels and ½ bbls. .01⅜ @ .01⅝
In tubs. .01⅝ @ .01¾
In tin cans. .01½ @ .02⅛
In bladders. .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton. .. $30.00@$35.00
Asphaltum, Rock, ₩ ton. $14.00
Coal Tar Felt, 1 Ply, ₩ ℔. .2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl. $2.25

Pipe, Drain .50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive. 60@60&10%
Other sizes. 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches. 60@60&10%
Other sizes. 55@55&10%

Pipe, Spiral—

Galvanized. 60%
Tin. 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D. ₩ bbl. $1.17@$1.18
Rosin, E. & F. ₩ bbl. $1.30@$1.45
Rosin, G. & H. ₩ bbl. $1.60@$1.80
Rosin, I. & K. ₩ bbl. $2.20@$2.65
Rosin, M. & N. ₩ bbl $3.10@$3.20

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr. $3.25@$4.50
Pen Argyle, ₩ sqr. 3.50@ 4.25
Peach Bottom, ₩ sqr. 5.00@ 6.25
No. 1 Chapman, ₩ sqr. 4.00@ 4.65
Lehigh Slates, ₩ sqr. 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr. 2.70@ 3.20
Purple, ₩ sqr. 3.50@ 4.50
Unfading Green, ₩ sqr. 3.50@ 4.00
Red, ₩ sqr. 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½. 13½@14¢
No. 1. 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔. 4¢
Smaller quantities, ₩ ℔. 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔. 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8lbs., about 500 ℔, ₩ ℔. 3½¢
½ bbls., about 300 ℔, ₩ ℔. 4¢
Kegs, about 110 ℔, ₩ ℔. 4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔. 4¢
(5% dis.)

Yager's Soldering Salts.
¼-℔ bottles, each. 80¢
Large quantities, per ℔. 40¢

Spelter—

Western Spelter. 4¢@4½¢
Sertha (pure). 8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized. 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔. 21½¢
Straits, pigs, ₩ ℔. 20½¢ @ 21¢
Straits in bars, ₩ ℔. 22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20. $7.00
Alderly, extra quality, IC, 14 x 20. 6.37½
Allegheny, IC, 14 x 20. 6.12
" IX, 14 x 20. 6.38
Apollo Roofing, IC, 14 x 20. 6.00
" " IX, 14 x 20. 7.00
Atlantic, IC, 14 x 20. 5.75
Bonus, Extra Coated, IC, 14 x 20. 6.75
" " " IX, 14 x 20. 8.25
Buckeye, IC, 14 x 20. 7.00
" IX, 14 x 20. 8.25
Chicago, IC, 20 x 28. 11.50
Central, IC, 14 x 20. 5.37½
Climax, IC, 14 x 20. 5.70
Columbia, IC, 14 x 20. 7.00
Crescent, IC, 14 x 20. 6.00
Dane, IC, 14 x 20. 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20. 5.50
" Mohawk, IC, 14 x 20. 5.50
Dunlap's Double Dipped, IC, 14 x 20. 8.25
" " " IX, 14 x 20. 9.50
" Domestic, IC, 20 x 28. 12.00
" " IX, 20 x 28. 15.00
Empire, IC, 14 x 20. 6.12½
Extra Central, IC, 14 x 20. 5.62½
Flag, IC, 14 x 20. 5.50
Fort Pitt, IC, 20 x 28. 11.00
Globe, IC, 14 x 20. 5.75
Hamilton's Best Redipped, IC, 14x20. 6.25
" " " IX, 14x20. 10.75
Hickory (Resquared), IC, 14 x 20. 6.37½
Juno, IC, 14 x 20. 5.75
Kensington, IC, 14 x 20. 6.75
" IX, 14 x 20. 8.00
Knoxall, IC, 14 x 20. 6.00
Laufman's Apollo (Resquared), IC, 14 x 20. 8.12
Laufman's Apollo (Resquared), IX, 14 x 20. 9.37
Leominster, Extra Coated, IC, 14x20. 7.75
Lion (Stamped), IC, 14 x 20. 6.25
Lula, Best Charcoal, IC, 20 x 28. 12.50
" " " IX, 20 x 28. 16.00
Manhattan, IC, 14 x 20. 7.00
Maple, IC, 14 x 20. 6.50
Merchant's Old Method (Resquared), IC, 14 x 20. 9.50
Merchant's Roofing (Resquared), IC, 14 x 20. 8.50
McKinley, IC, 20 x 28. 12.00
" IX, 20 x 28. 15.00
Neville, IC, 14 x 20. 6.00
" IX, 14 x 20. 7.25
N. F. Old Style, IC, 14 x 20. 7.50
" " IX, 14 x 20. 9.00
Old Colony, IC, 14 x 20. 8.00
Optimus, Best Redipped, IC, 14 x 20. 8.25
" " IX, 14 x 20. 9.50
Osceola, Hand Coated, IC, 14 x 20. 8.25
" " " IX, 14 x 20. 9.75
Pacific, IC, 14 x 20. 5.25
Palacio, IC, 14 x 20. 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20. 8.50
Phœnix, IC, 14 x 20. 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20. 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20. 10.75
Taylor Old Style (Resquared), IC, 14 x 20. 9.25
Taylor Roofing, IC, 14 x 20. 8.00
Thomson's Puritan, IC, 14 x 20. 5.75
Tip Top, IC (Resquared), 14 x 20. 6.62
" IX " 14 x 20. 7.88
U. S. Monongahela, IC, 14 x 20. 6.50
U. S. Redipped, IC, 14 x 20. 9.25
Venux, IC, 14 x 20. 5.60
Vigilant, IC, 14 x 20. 5.50
Waldo Redipped, IC, 14 x 20. 7.25
Westmoreland, IC, 14 x 20. 6.25
Wilkinsburg Redipped, IC, 20 x 28. 16.00
" " IX, 20 x 28. 19.00
Willow, IC, 14 x 20. 6.25

American Bright Plates

Almond, IC, 14 x 20. $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20. 6.50
" IX, 14 x 20. 8.00
Florence, IC, 14x20. 6.75
Hazel, IC, 14x20. 5.80
Iowa, IC, 14 x 20. 5.75
" IX, 14 x 20. 7.00
Linden, IC, 14x20. 6.50
Merchant's Dipped, IC, 14x20. 11.00
Merlon, IC, 14x20. 6.75
Mint, IC, 14x20. 6.00
Palma Xtra, IC, 14x20. 7.25
Phœnix, IC, 14x20. 6.25
" IX, 14x20. 7.75
Royal, Extra, IC, 14x20. 7.00
U. S., IC, 14x20. 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20. $5.65
20 x 28. 11.00
IX, 14 x 20. 6.40
20 x 28. 12.80
Abercarne Grade.—IC, 14 x 20. 5.50
20 x 28. 10.75
IX, 14 x 20. 6.40
20 x 28. 12.80

Imported Bright Plates

Charcoal.
Duty: 2.2¢ ₩ ℔.
Melyn and Calland Grade. IC, 10 x 14. $6.50
" " IC, 12 x 12. 6.75
" " IC, 14 x 20. 6.50
" " IC, 20 x 28. 13.00
" " IX, 10 x 14. 8.50
" " IX, 12 x 12. 8.75
" " IX, 14 x 20. 8.50
" " IX, 20 x 28. 17.00
" " DC, 12½ x 17. 6.00
" " DX, 12½ x 17. 8.00
Allaway Grade. IC, 10 x 14. 6.00
" " IC, 12 x 12. 6.25
" " IC, 14 x 20. 6.00
" " IC, 20 x 28. 12.00
" " IX, 10 x 14. 7.25
" " IX, 12 x 12. 7.50
" " IX, 14 x 20. 7.25
" " IX, 20 x 28. 14.50
" " DC, 12½ x 17. 5.50
" " DX, 12½ x 17. 6.75

Coke.
Steel Coke.—IC, 10x14, 14x20 $5.40@$5.50
10x20. 8 25
20x28. 11 50
IX, 10x14, 14x20. 0.75
B. V. Grade.—IC, 10x14, 14x20. 5.50

Imported Boiler Plates

IXX, 14x26..(112 sheets). $13.35
IXX, 14x28..(112 sheets). 14.50
IXX, 14x31..(112 sheets). 16.00

Tinning—

Brass and Copper. .net

Tubing—

Tin. 55%
Galvanized. 55%

Brass and Copper.
Standard List. 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks, Stove—

Improved Lock Frame, per doz. $10.00
Steel Lock Frame, per doz. 18.00
Daisy Improved Pattern, ₩ doz. 18.00

Zinc—

600 ℔ casks. ₩ ℔ 5¢
Per ℔. 5½¢

It Is Reported—

That on January 29 the Hardware store of H. Lawrence, Rosamond, Ill., was destroyed by fire.

That the firm of Arnold, Thayer & Co., dealers in Hardware, Implements, &c., Chenoa, Ill., have been dissolved. William and Oscar Arnold have succeeded to the Implement part of the business, while C. E. Thayer will continue the Hardware department under his own name.

That Teel Bros.' Hardware store at Terre Haute, Ind., was robbed on January 27. A large quantity of Knives and Revolvers were carried away.

That E. J. Soper of the late firm of Alberty & Soper, Hardware dealers, Perry, N. Y., will after April 1 be connected with the Deering Harvester Company as traveling man.

That the Mansfield Hardware & Furniture Company have been incorporated at Mansfield, Ill., with a capital stock of $10,000. The incorporators are C. F. Mansfield, M. B. Mansfield and William Clemens.

That the Hardware firm of Hanke & Scharf, Newton, Iowa, have been dissolved by mutual consent. Philip Scharf will continue the business, Mr. Hanke retiring. The latter will take to the road for a wholesale house.

That Albert Bauman has bought a half interest in Henry Ammon's Hardware store at Peotone, Ill.

That Gus Haegg and Emil Kuhlen have bought out the Hardware firm of Clark & McKinney, Rockford, Ill., and will take possession of the business on March 1. Mr. Haegg has been in the employ of the firm and is well posted in the business.

That Klove & Mosey have bought out Hanson's Hardware store, at Ottawa, Ill., and will remove the stock to their own establishment.

That Charles J. Boesel of New Bremen, Ohio, has purchased E. P. Bennington's Hardware store at Galveston, Cass County, Ind.

That the Stoddard Hardware Company, Minneapolis, Minn., have been incorporated. The capital stock has been fixed at $50,000. Fred. L. Stoddard, Geo. P. Derickson and William B. Millar are the incorporators of the company.

That Samuel M. Wilkinson, formerly of Mansfield, Ohio, and later engaged in silver mining in Mexico, and Miles J. Watson, late of the firm of Godley & Watson of Mansfield, have entered into partnership under the firm name of Wilkinson & Watson, and will soon open a new Hardware store in Mansfield.

That J. A. Gleason has disposed of his Hardware stock at Tipton, Ind., to George Shortle.

That Andrew Mueller, North Milwaukee, Wis., opened his new Hardware and Stove store on February 1.

That the explosion of a tank of naphtha in the Hardware store of Durham Brothers, Maxwell, Cal., on the 26th ult., entailed considerable damage to the stock.

That M. L. Stringer has disposed of his Hardware business at Otisville, Mich., to Pettit & Craig.

That Col. J. F. Drish has sold his Hardware store at Mattoon, Ill., to Mr. Swickerd of Greenup, securing some farm property in exchange. Colonel Drish has been identified with the Hardware business of Mattoon since the close of the Civil War.

That Klavido & Stepanek is the style of a new Hardware firm organized at Traer, Iowa.

That the Hardware firm of Rood & Greenwood, Erwin, S. D., have dissolved partnership, Mr. Greenwood having disposed of his interest to A. W. Stone.

That Steinman & Smith have sold their Hardware store at Jenera, Ohio, to L. D. Reddick of Arlington, Ohio.

That the Hardware firm of Giddings & Patterson, Danville, Ill., have been dissolved. James A. Patterson retiring. The business will be continued by J. W. Giddings and his son, Frank A. Giddings, under the firm name of J. W. Giddings & Son.

That H. W. Crane & Co., Mt. Pleasant, Iowa, have sold out their stock of Hardware.

That the Falley-Patton Hardware Company, Lafayette, Ind., have been incorporated with a capital of $10,000. Susanna B. Falley, James B. Falley and Jacob Patton are named as directors for the first year.

That Auguste Couillard, Hardware merchant of Montreal, Que., has sold out his stock to Dumont Laviolette. The business will be continued under the old style by D. Laviolette and O. W. Lauriault.

That the Anderson Hardware and Furniture Company, St. Mary's, Kan., have been incorporated, with a capital stock of $5,000.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, February 24, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

A Too Common Fault in Ventilation.

In many cases wherein a sufficient volume of air for ventilation has been provided for by mechanical aids, a noticeable fault in the system is the employment of ducts of too contracted area and the generation of too high velocity in the currents of pure air supplied. The evil effects are two-fold. In the first place, it is very disagreeable to sit in a room where the air is moved with undue velocity, and in the second place, the pure air supplied instead of remaining a comparatively distinct layer and pushing the impure air bodily out before it, thus removing the foul air from the vicinity of the occupants, is, by the violence of the currents, compelled to intermix with the impure air, thus greatly impairing the useful effect of the air admitted. Replacement rather than mere dilution or admixture is the main thing to seek in ventilation, and although some admixture is unavoidable, only a large volume moving at low velocity will secure the desired result in such measure as is attainable.

To Refresh the Cities.

The much talked of experiments of Professor Dewar, the British scientist, in the production of solidified air, appear to have stimulated the imaginative faculties of a correspondent of an English trade journal to an extent which must give his friends some anxiety. He proposes, in case these experiments are developed to a practical issue, the establishment of a new industry, which is nothing more nor less than the commercial preparation of solid mountain air for use in cities. Works, he suggests, might be started in Switzerland, New Zealand and other salubrious hill countries for the production of solidified Alpine air, which, sufficiently compressed and stored in seamless steel tubes, could be exported to London—for example—and let loose on the underground railway and other parts of the British metropolis, where such a "refresher" would be most appreciated. The idea is a seductive one.

A Mechanic's Eye.

BY FOSSIL.

It may be a question whether the possession of that talent or faculty which the title indicates is an unalloyed blessing, for the reason that oculars of that description are somewhat sparsely distributed and the deficient are constantly placing the evidences of their having "eyes which see not" in the way of the proficient, by a disregard of lines and levels. The mechanic's eye sees that the pictures and curtains don't hang plumb, the stove is not parallel with the wall, or its upright pipe perpendicular, and the same vexation is found in the street, where careening posts and oblique sign boards beget a desire to square things up. Although these mechanical irregularities are to educated eyes a so-called "eyesore," yet there is a fascination in their angles which compels regard and the acute gazer looks and loathes, while he who is obtuse can discover no fault. "Where ignorance is bliss, 'tis folly to be wise." When one of the "rectangulars" saw the celebrated leaning tower of Pisa he remarked: "I don't believe the man who built that ever got another job around here."

We read that "Poets are born, not made," and the saying would seem to apply to mechanics when their difference of efficiency is noted, and it is undisputed that men of equal technical training vary widely in its practical application. There is an old adage which reads: "'Tis education forms the common mind; just as the twig is bent the tree's inclined," but the statement is open to criticism, for although education or bending the twig may incline the shape of the tree it will not change its nature. For off thorns men do not gather figs, neither off a bramble bush gather they grapes, even if the said thorn and bramble are carefully bent in the time of twigdom. Circumstances have placed many a square man in a round hole which he may endeavor to fill but can never fit. There are infallible symptoms by which we may know the embryo mechanic, but these are commonly unnoticed or ignored by the guardians of our nonage, especially if they conflict with the optimism of ambitious parents, who see a possible President in every male child they are blessed with, and if circumstances will permit put it upon a life track of misfit gauge, which involves almost a rebuild. A young hickory tree may be bent and secured with its top reversed and growing earthward until a permanent crook is formed, which is desirable in a walking stick, but destructive of other and better uses of the tree. In like manner are young people forced or allowed to drift into foreign and abnormal means of livelihood.

How, then, may these evident mistakes be avoided—not cured—and of what profit would the improvement be? Phrenology claims to find the leading influences of the brain manifested by protruberances of the skull, but it requires an expert to read them; also in childhood they are liable to be complicated with accidental bumps. It is said that the Yankee baby—and the term means a trait rather than nativity—will develop the mechanic's eye very early, and apparently criticise the construction of its own cradle, which saying has a germ of truth in it and teaches the propriety of carefully observing the natural tendency of the youthful mind. There are college alumni whose educational veneer soon wears through, and graduates from the workman's bench who have attained to intellectual superiority. There is a lesson in the climbing beans which some of us have cultivated. When their tendrils begin to reach after a support, it is in vain that we offer them an unsuitable stick, or endeavor to train them away from the natural spiral. Wherefore let those who would train humanty consider the beans.

It is a grand thing that we have in these days the various branches of specific education, in which the youth, if circumstances allow a choice, may follow his natural bent. If the State for its own good assists in mental culture with measured success, would it not be wise and consistent to advance to more extended usefulness by a public support of technical schools, so that the advantage of being born with a mechanic's eye may not be lost through lack of pecuniary means? The country needs its army and navy, and provides the same at considerable national expense; also it requires artisans, whose right to free education in trade schools may be assumed for equal reasons. If when our boys advance from the destructive to the constructive age they are put—having the predilection—in (to be) State endowed technical schools the prediction may be hazarded that a less number of misfits will result than now appear among university graduates. We may not expect—should our wishes be gratified—an immediate mechanical millenium, but if the survival of the fittest is desired, we may earlier find out who they are. Botches, like the poor, will be always with us, yet it is possible to decrease their numbers by the sifting process of trade schools, for the inclination that leads the youth to enter will probably carry him more or less successfully to the goal he seeks. The term "Jack of all Trades" has been applied in derision to those workmen who are "everything by turns, and nothing long," a result of versatility of purpose rather than of talent. Yet may it not be given in honor to those who, having the mechanic's eye, can tell a straight stick from a crooked one, and are further qualified for handicraft by a self-chosen mechanical education.

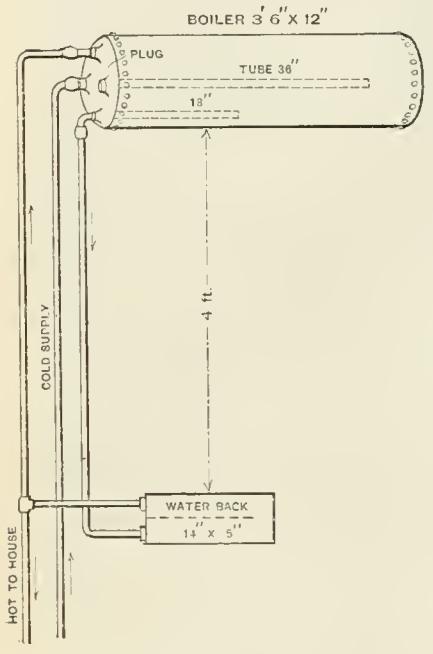
Such are the so-called "handy men," whose knowledge of the cardinal principles of any primary trade will enable them to see the possibility of their application to many others. In this age of labor saving machinery he who is merely the slave of the machine, and as easily discarded and reversed as a cog or bolt, will remain at a corresponding level, while those whose natural and acquired ability makes them its masters will advance in the attainments of head and hands. To this end let that quality known as the mechanic's eye be sought for, and when found carefully cultivated.

Efforts are being made toward an early reorganization of the Nicaragua Canal Construction Company.

THE LETTER BOX.

Cold Water from Boiler.

From H. and J., *Pennsylvania.*—The accompanying illustration is of a water back and range boiler that we have recently inspected that is giving but very little hot water. Two styles of water back and a coil of pipe have been used in fire chamber of range. The



Cold Water from Boiler.

boiler is located horizontally over the range, and it will be seen that the pipe for hot water to the house is also used as a circulating pipe from the water back to the boiler. There is a tube in the bottom connection of the boiler for carrying cool water from boiler to water back. The pipes are all ¾ inch galvanized, and seem to have plenty of elevation where required, but for some reason there seems to be but little circulation. The people who erected this work have put in a number of vertical boilers, which work well, in which they closed up the side or return opening in the boiler, and connected same with a T at the top of the boiler where the hot water supply is drawn for the house. Will you kindly give us your opinion in *The Metal Worker*, or refer us to a similar question previously answered.

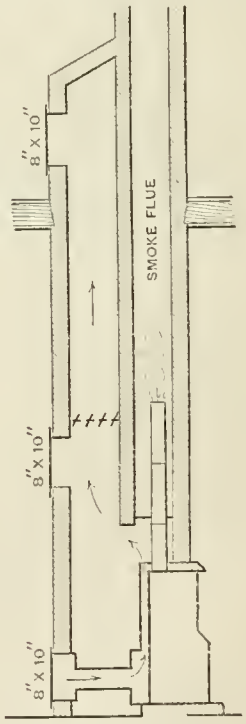
Answer.—The failure to secure hot water is due to the manner in which the connections are made. Cold water, being heavy, is the first to fall from the boiler. When hot water is drawn from a boiler cold water will enter and fall to the lowest point it can reach. Running the hot water service pipe down always interferes with the flow, and if connected as in this case, the hot water will not flow down because heavier and colder water can enter the pipe and prevent it. The movement of water through the piping shown, on the opening of a hot water faucet, would be, cold water would enter the boiler through the long tube and pass out through the short tube below to the water back and out of it through the usual hot water outlet and into the hot service pipe; the water flowing through the back so quickly that it is not much heated. This would not occur if the return pipe from the water back was connected at the plugged opening in the boiler and the hot water service kept separate. It is probable that no trouble would be experienced with the present connection if the hot water service ran up from the top of the boiler instead of down from the top of the water back. That some hot water can be drawn is probably due to the boiler being full of hot water at the start, but which is soon replaced to the level of the short tube by the cold water that enters. When the return from the water back is connected at the top of a vertical boiler a very different condition exists.

Pipes from Tank.

From M. B. C., *Christiania, Pa.*—Referring to difficulty of securing flow of water from tank to cistern through overflow pipe, as stated in *The Metal Worker* of December 23, I suggest two plans to overcome the trouble: 1. Instead of reducing overflow pipe from 3 inches at tank to 2 inches at outlet, reverse it, making 2 inches at tank and 3 inches at outlet, and he will have no trouble. 2. Instead of passing overflow pipe through side of tank and turning down into elbow, put up inside of tank to the hight desired, so the course will be straight down, and if there are no traps there will be no trouble.

Fails to Heat First Floor.

From J. J. WILSON, *Baltimore, Md.*—I notice in *The Metal Worker* of January 20 an inquiry from "A. G. D," Marlton, N. J., in regard to fire place heater, and the illustration I send will explain itself. It is very evident that parlor cannot be heated without a positive exhaust from it. By making a box-shaped enlargement in the back of the stove casing, so the cold air can have an easy turn, and attaching a pipe collar to this and the pipe leading from box attached to exhaust register, the room can be easily heated. Another source of trouble, I think, comes from the space between top of register and cut off, or flue damper, which is 4 inches. This should be so arranged that it would line up on a level with the top of the register, and would be better if back of cut off was lowered, so air would be deflected into the register opening. If the hot air flue is directly over the stove and the smoke pipe is carried to a side flue, all space back of the stove should be walled up to the hight of stove, and in a great many cases this is the cause of stoves not heating the room in which they are placed, as this permits the air to pass outside the casing and become only partially heated, while by being bricked up close all air passing under the stove is forced up between the casing and stove and thoroughly heated. Last November I was called to look at a stove in Philadelphia, put in by a customer, which had been taken down twice and some changes made, but without deriving any benefit. The house was on the east side of the street, exposed to west and northwest winds. The room in which the stove was placed was 12 x 22 feet, with three large windows, and the long side of the room with exposed wall. The stove set in one end of room 22 feet from further wall. The trouble complained of was that the stove would give plenty of heat in the two rooms above, but would not heat the room



Fails to Heat First Floor.

in which it was placed. Upon examination I found a space at the back of the stove of 12 inches. I had a wall built up directly against the back of the stove, filled in the space and placed an 8 x 10 inch exhaust register at the floor line, and connected same by a 7-inch pipe with a flue adjoining stove flue. Results, this room is thoroughly heated during the coldest weather.

Heat Proof Black.

From L. B. N., *Chicago.*—In reply to your correspondent "A. J. T.," Boston, Mass., who wishes a black coating for a locomotive boiler, I would refer him to the Nubian iron enamel made by the Nubian Iron Enamel Company, Cragin, Ill.

Fails to Heat the Room.

From READER, *Pennsylvania.*—I have had some trouble with a furnace of late, on which I would like to have some help. The furnace is in the cellar of a modern hotel, and has five 10-inch pipes connected to it. On the north side of the building there is a small addition built, covering a space about 10 x 14 feet, which is heated by a 10 inch pipe 16 feet long, which has a rise of 18 inches. There is no cellar under this new part, and the wall is not very well pointed, but this pipe is wrapped with asbestos paper, while the rest are not. I do not see why it will not heat. I did not set up the furnace myself. It has been in use about four years, and an 8-inch pipe was used before, but as it would not heat I thought by changing it and putting on a 10-inch pipe it would be all right. The other pipes all have an equal share of heat, but the pipe next to the one that fails to heat is a very short one; it only has one length of pipe and runs to a floor register. Some of our men think by running the pipe so that the rise is made in the first 4 feet, and then running the other 12 feet level that it will heat better, but that does not seem right to me.

Answer.—The long pipe is more than likely robbed by the short one, and if a sheet of tin is bent into a half circle and put into the top of the long pipe at the furnace so as to extend in and collect a body of hot air this trouble may be overcome. Giving all of the elevation to the first 4 feet of the pipe will not overcome the trouble, as the air has to flow against the prevailing air currents. A room is heated by a continual current of hot air coming into it, consequently some air must continually go out. If a door is open between this room and another, the hottest air will leave and the room will not be heated. If the door is closed and no flue provided for the air that has come in and cooled to get out, the amount of air that can come from the furnace will not be sufficient to keep the room warm. Under such conditions some successful furnacemen put another register in the room and run a pipe from it back to the furnace, so as to exhaust the cold air and leave room for the hot air to enter.

Difficulty with Drive Well.

From E. C. W.—Let "M. W.," Little Falls, N. J., whose trouble is reported in *The Metal Worker*, February 17, attach his pump to a ¾-inch pipe and slide the pipe down inside of the 1¼ inch driven well. If there is water enough within 25 feet, it can be pumped out. After this is proven and a larger supply of water is wanted than will come through a ¾ inch pipe, let him drive down another pipe within 1 foot of the well pipe, to supply air to it, and put his pump on the well pipe again. His well is air bound and any method that will relieve it will make the pump work. When he makes his pump work let him tell in the Letter Box how it was done.

From W. M., *Ridgewood, N. J.*—Having read in *The Metal Worker* of February 17 the letter of "M. W.," Little Falls, N. J., asking for information in regard to a driven well, I notice that he forgot to mention what depth or hight of water he has in his pipe. He may have overlooked the important point of attempting to lift water beyond the limit of 28 to 30 feet by not digging down and placing the valve cylinder and extending plunger rod lower. If this is not the cause, he has driven the point too deep. I find in my experience with driven wells that one can drive past a vein of water and have water in pipe, but it will still be air bound. I find by using a little precaution in driving, by stopping as soon as I strike the water vein, that 2 or 3 feet of water is enough, or sufficient to cover the strainer. Then water comes in freer and the pump works better than driving the point far below and having the water down along the pipe with 8 or 10 feet of standing water. So I would advise the correspondent above to pull up to where he first struck the water vein.

Better Marked Stove Repairs.

From 6-23-21.—In answer to "J. F. T." in the Letter Box, February 10, if he will do as I do he will save himself a great deal of trouble. I take my goods when they come in and mark them then. Some men may not be able to do this, as they do not know one piece from another, but they should learn.

From SHURTER & BRIGGS, *Poughkeepsie, N. Y.*—In answer to "J. F. T.," Meadville, Pa., in *The Metal Worker*, February 10, in regard to trouble with stove repairs, here is a slip that we use which saves us considerable trouble:

Date..... ... Ordered of..... .

For. .. .. Deposit.....

Name.....

No..... Date..... ....

Parts Ordered .....

SHURTER & BRIGGS,

Poughkeepsie, N. Y.

Stove Repairs.

Via..... ....

Name ....

No ..... Date.....

Maker..... ....

Parts Wanted .....

- -

TEAR OFF THIS SLIP AND

ENCLOSE WITH INVOICE.

Name..... ....

No..... Date.... .. ...

Maker..... ....

Am't Due... .. .. For..... ..... .

Paste Stove Polish.

From YATES & Co., *Rockford, Ill.*—In answer to "C. K.," St. Louis, Mo., in *The Metal Worker*, January 27, would say that if he will send us his full address we will mail him a pamphlet telling how to make first class paste stove polish at 3 to 6 cents per pound, that will prove a rust proof application and an elegant durable jet black luster.

Fails to Bake on Bottom.

From J. B. O., *Baltimore, Md.*—Referring to your note on page 30 of *The Metal Worker* of February 3, the theory advanced is very true, but practical experience is much better, although it may conflict with our theoretical ideas and perhaps put them to flight. In the mouths of two or three witnesses the thing is established, and we have them on that same page. "Stove Dealer," Port Henry, N. Y., says he obviated the difficulty by extending the flue strip. In several instances I have done the same thing. That was to prevent the products of combustion from passing too rapidly through the flue. "D. H. B." Phœnix, Ariz., writes that the flues of the ranges are too deep. Try putting ashes or sand, 1 or 1½ inches in depth, on the bottom plate. Why do that? Simply to reduce the size of the flue and stop the gases and heat from passing so rapidly through the flue. I have also tried that experiment and found it to work. It is a nice thing to strike a proper medium in the size of the flues in the construction of either stoves or ranges.

Left Handed Tinners.

From RIGHT HAND, *Pennsylvania.*—I would like to inquire of the tinners if any of them ever heard of a left handed tinker or tinner; that is, a tinner who cannot conveniently use his right hand, but must always use his left, and if there are any tools made for such a left hander. I know there are left handed snips, but never heard of any bench tools. Did any of you mechanics ever have any experience with such a man; if so, state your experience in *The Metal Worker*? I once had a man in my employ who was a good helper on outside work and the only difficulty with him was that he was left handed. He once tried to put up some spouting alone, as he had freely expressed himself that he could do spouting as good as the "jour." whom he used to help. The "jour." at last became disgusted with hearing it so often, and one day he left him at a job that both had started, to see what he really could do. The "jour." told him that he must go away to measure another job and that he should go ahead and spout the house until he came back. The "jour." was gone probably one hour and a half, and as he came around the corner on his return he saw a large crowd of boys and girls from a neighboring school. At first the "jour." thought that the left handed man had fallen from the ladder, but as he came near he saw what the excitement was about. The children were watching him try to solder with his left hand, and such soldering! Why, he had nearly a half a bar of solder on the ground, and such a looking joint! Some one in the crowd said the man was turned around and mistook his left for his right hand. To say that he was mad is putting it mildly, but then it took the conceit out of him, and he has since quit the tin trade, saying it was no trade where one cannot use his left as well as others use their right hand to work.

PLUMBING and GAS FITTING.

Plumbing Instruction at the Pratt Institute.

The pressing need in the larger cities of the United States for better facilities for the efficient trade education of American boys, in order to equip them for entering the manual trades and meeting the competition of foreign labor under the most satisfactory conditions possible, is a subject which, we are glad to notice, is attracting an increased amount of interest and attention throughout the country. The establishment of trade schools for this object has of late years received considerable stimulus from the marked success attending enterprises of this character which have been initiated in some of the Eastern cities. Among them that founded by the late Colonel Auchmuty in New York has been the pioneer and exemplar. Each of these schools has been started more or less on the original lines embodied in the New York Trade School, and each by success has proved the wisdom of this plan as a substitute for the old and inadequate apprenticeship system.

Pratt Institute Trade School.

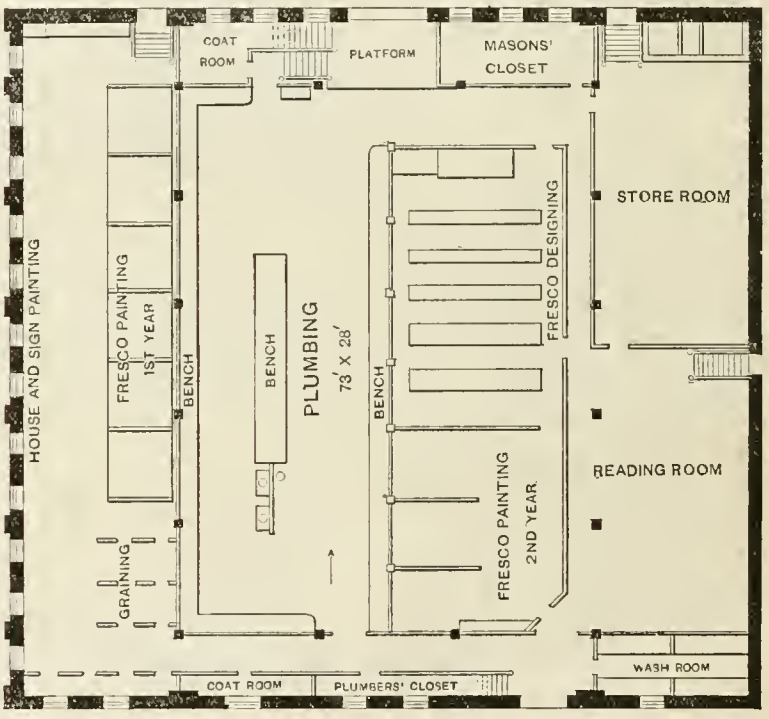
Among the best known and most complete of these institutions is the trade school attached to that successful center of manual and industrial training, the Pratt Institute of Brooklyn, to the good work of which reference has been made from time to time in these columns. In *The Metal Worker* of June 20, 1893, a notice was printed in regard to the plumbing class of the school, which appears to have drawn interested attention to the facilities for trade instruction there offered. We now take pleasure in presenting to our readers some further details respecting this flourishing and successful class, which, together with the accompanying illustrations, will furnish a good idea of a modern plumbing school, thoroughly equipped and in many respects a model of its kind.

The Trade School.

The Pratt Institute Trade School, of which the plumbing class constitutes the most important feature, in view of its size and the perfection of its arrangements, was inaugurated five years ago as an integral part of the Department of Science and Technology. This department occupies one of the largest of the imposing group of buildings forming the Pratt Institute, situated on Ryerson street and Grand avenue, in one of the most salubrious and accessible quarters of the "City of Churches." The structure occupied by the plumbing and painting classes is an annex to the Science and Technology Building. It is a substantially constructed fire proof edifice of one story, 103 x 85 feet, its internal arrangements being laid out in the manner indicated in the plan view, Fig. 1. The school is entered from the adjoining building by a flight of steps, shown on the plan, which lead into a reading room containing tables and chairs and furnished with trade and technical papers. This feature has been found to be much appreciated by the students, many of whom are in the habit of coming early in order to peruse the trade journals before class hours, thereby gaining much valuable information and assistance in the special line of their studies.

The Plumbing Class.

The room devoted to the plumbing class, shown in Fig. 2, is a lofty, light and well ventilated apartment 73 x 28 feet. It is equipped to accommodate 53 pupils at benches which surround the entire room. Each member of the class is provided with a gas furnace for melting solder and a drawer holding a complete kit of tools, consisting of the following articles, 23 in all: Knife, gas pliers, hammer, file, rasp, dresser, hook, wrench, copper bolt, soldering iron, ladle, pot, compasses, grease box, saw, large turn pin, small turn pin, rule, shave hook, soil cup, bending iron 1, bending iron 2, sand plug and tap borer. Every pupil is held responsible for the preservation of his own tools, and his kit is periodically mustered and checked by one of the instructors. In common with the evening classes the principal aim of the plumbing class is to broaden and extend the training of those already engaged in the trade. It is held on three evenings of the week, Monday, Wednesday and Friday, from 7.30 to 9 30, and is in charge of two instructors who are practical plumbers of reputation. A number of the pupils also attend the mechanical drawing classes of the institute on the alternate evenings, thus acquiring a competent knowledge of this accomplishment, which is becoming so valuable to the modern scientific tradesman.



Plumbing Instruction at the Pratt Institute.—Fig. 1.—Plan View of Trade School.

Attendance.

The class is primarily intended for the benefit of the apprentices and younger journeymen of the city of Brooklyn. It is not, however, confined to Brooklyn boys, for some or the present members hail from New York, Long Island City and Jersey City, and these latter are, it is said, among the most regular attendants. Regularity of attendance and punctuality are strongly insisted on. If a lad is absent on two consecutive school nights a communication is sent to him inquiring the reason. Should no satisfactory excuse be presented he is dropped from the course and cannot again join the class. However, we are told, it has very seldom been found necessary to resort to this extremity. The instructors state that the scholars, almost without exception, evince the most gratifying interest and delight in their work and the classes have been uniformly remarkable for their diligence and tractability.

Methods of Instruction.

The training is both practical and theoretical and calculated to thoroughly equip the learner for working at his trade in the shortest possible time. The courses of instruction are reduced to the most systematic form, and time is economized to the utmost. When the learner has mastered one thing thoroughly he is at once passed on to a new and more difficult operation. The reason for each step is carefully explained, and no operation is passed over before being thoroughly understood. The first exercises consist in making the pupil acquainted with the

names and uses of the various tools. In the manual course he is then instructed in regular order in preparing wiping cloths, making soil, tinning soldering irons, brass, iron, lead and tin, making solder, soldering seams, making cup joints, overcast joints, straight wiped joint, flanged joint and branch joint, working sheet lead into bends, traps, service boxes and safes, lining tanks, calking iron pipe joints and bending with sand and kinking irons. A study of the materials used and of the principles underlying practical methods and rules is made a prominent feature. In the plumbing class this instruction is given by means of talks and recitations. On each Wednesday evening of the course lectures are given dealing with the material used in the trade, the proper arrangement of drain, soil and waste pipe, drainage and ventilating the same, supply pipe, tanks, fixtures and boilers. Charts and diagrams are freely used in the instruction, and the examples of defective plumbing illustrated in the trade journals are frequently studied. Special pains are taken to make clear the principles underlying the plumbing rules of the City of Brooklyn. Those talks constitute a thorough analysis of the process of plumbing, and their substance is written down in note books arranged in the form of question and answer.

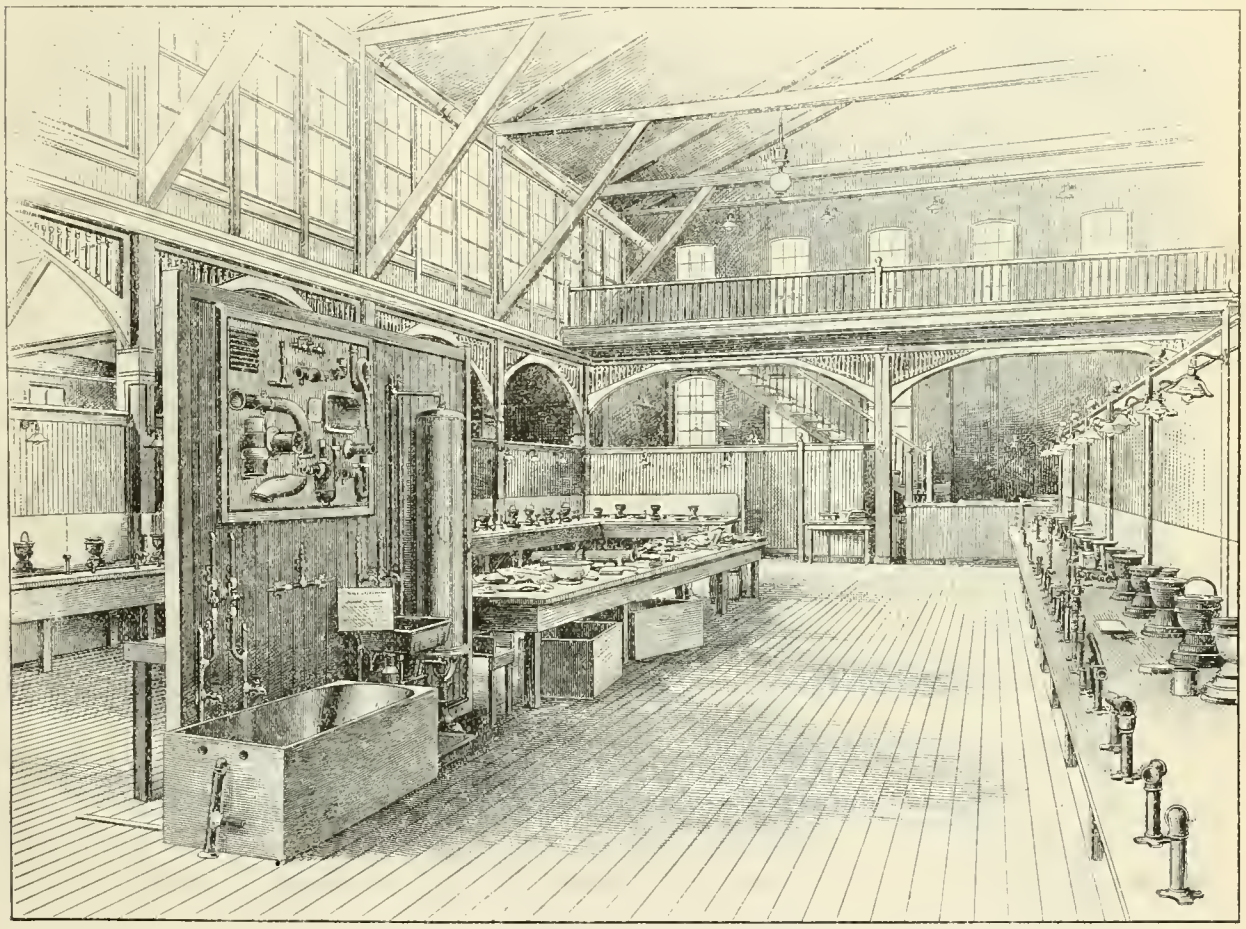


Fig. 2.—Plumbing Class Room.

Lectures and Question Books.

These books, which have been prepared for the use of the school by John Todd, one of the instructors, consist of eight separate courses, graded according to the progress of the learner. No. 1 treats of Drain, Soil and Waste Pipes; No. 2, Trapping and Ventilation of same; No. 3, Cold Water Supply Pipes; No. 4, Boilers; No. 5, Hot Water Pipes; No. 6, Trapping of Fixtures; No. 7, General Repairs; No. 8, Pumps and Miscellaneous Questions. These carry the pupil through every stage of theoretical education necessary to fit him for the duties of a modern, scientific sanitary plumber. The lectures are given in the lecture room of the institute by one of the instructors and last for one hour. He makes use of charts and the blackboard to illustrate and elucidate the subject. The various questions in the course book are taken up in turn and thoroughly explained. The first half dozen questions in Course No. 1 will give an idea of the general method. They are as follows :

1. Describe names and sizes of soil pipes used in buildings.
2. Describe their uses.
3. Of what material are they made ?
4. Why are iron pipes used ?
5. What are the objections to lead for soil pipes ?
6. Why are earthen pipes objectionable for house drains ?

Each pupil is provided with one of these books and also with a pencil and a pad of paper. On the latter he is expected to make notes of the lecture, copying them at his leisure into the blank spaces provided under each question in his course book. As each book is filled it is given in charge of the instructor, who keeps it until the end of the term. On the merits of the answers thus written, together with practical demonstration, depends the success or otherwise of the pupil when examined for his certificate at the end of the course.

Examination.

At the close of the course, which occupies two terms of six months each, an examination of the candidates recommended for certificates is held. A board, consisting of a committee from the Journeymen Plumbers' Association of Brooklyn, examines the members, due regard being had to both manual skill and the knowledge of trade methods, awarding certificates to those showing satisfactory proficiency. These certificates, in case of the holder afterward applying for admission to the association, are accepted in place of the examination of like character otherwise required. This arrangement, which has now been in operation the past two terms, is found to work admirably.

Prof. Charles R. Richards, director of the Department of Science and Technology, who is the manager of the trade school, in his last annual report speaks as follows in regard to this feature : "The result of the first year's cooperation with the Journeymen Plumbers' Association has been encouraging. The committee for the association have been regular in their attendance, and have displayed much interest in the progress of the class, and the students, on the other hand, have undoubtedly been considerably stimulated by their presence. The examination held by the committee in our company with our instructors at the end of the term resulted in the recommendation of three of the second year students as worthy of certificates." The number expected to graduate at the end of the current term will be much larger, as the three who were awarded certificates at the last examination happened to be the only pupils who

had been long enough under instruction to obtain the advantages offered under the new arrangements.

Instructors.

The two instructors at present in charge of the plumbing school have been with it since its inauguration. To them is mainly due the credit for bringing it to its present atate of efficiency. They are John Todd, an inspector under the Brooklyn Department of Health, and George Heath, both of whom are

John Todd, Instructor of Plumbing, Pratt Institute.

well-known and experienced Brooklyn plumbers. That their faithful efforts and personal influence have been felt and appreciated by the pupils is testified by a flattering presentation made to each at the close of the last term, when Mr. Todd was presented with a set of Dickens' works and Mr. Heath with a handsome chair. We are glad to be able to present herewith portraits of Messrs. Todd and Heath. The

George Heath, Instructor of Plumbing, Pratt Institute.

school, as we have intimated, is pre sided over by Professor Richards, who is a most enthusiastic advocate and sup porter of the trade school movement. To his unwearied efforts and fostering care the success of the school in general is largely due. Professor Richards is always ready to afford any information in regard to the trade classes to any who are desirious of availing themselves of the unusual advantages and facilities provided at the Pratt Institute Trade School.

We need only add that the full course of instruction, entitling a pupil to examination for a certificate, comprises two periods of six months each, beginning on October 1 and ending March 31. All tools and materials are furnished free of charge and a fee of $15 is payable for each six-monthly term. Applications are received only from persons between the ages of 16 and 25.

Sanitation in the House.

The following paper was read by Robert Morgan, New Haven, Conn., at the convention of the master plumbers of Connecticut, held at Hartford, February 15:

I wish to state before reading this paper on "Sanitation in the House," that it is not my intention to act the part of instructor to this body of men, but the subject having been assigned me, I will try to do it justice as far as I am able. Houses, though first erected to insure comfort and protection to the human race, often fail of attaining this object, and frequently become the indirect cause of many evils. These evils have led to much investigation and effort by scientific men, with results that have mitigated them to some extent.

WHAT SANITATION IMPLIES.

Sanitation is now a word in constant use, and communities, large and small, are interested in its significance. This word implies the adoption in the house of all snch means as science and the wisdom of students of hygiene approve of, for the prevention of disease and the promotion of health; hence many considerations enter into the construction of a sanitary dwelling—conditions of air, ventilation, water, drainage, &c. And first in importance is a plentiful supply of pure air. In former days, when people depended for warmth upon the blazing logs in the wide open fire place and strong currents of air swept in under doors and around the rattling windows, there was little danger of a lack of pure air, but in these days all is changed. Houses are built as nearly as possible air tight, and the cheery, open wood fires are almost a thing of the past. Experience has led us to devise new methods of getting a supply of fresh air, by means of the various appliances in connection with the vent shaft.

Water is one of the prime necessities of life and ranks next to air in its effects on human life. Some physicians even claim that disease is more frequently conveyed through the medinm of impure water than by the atmosphere. Pure drinking water at least is of the utmost importance to the preservation of health. The scientist claims that absolutely pure water can only be obtained by repeated distillations, but the sanitarian in speaking of pure water means water that is practically free from noxious gases, injurious organic matter and some mineral or metallic ingredients Water drawn from lakes situated at some elevation above the town supplied is regarded by sanitary experts as the best for general consumption. There should be a generous supply of water in the house, plenty to drink, plenty for the bath and an abundance for flushing purposes

It is a comparatively easy matter to bring water from a distance to supply large or small communities, but the problem of the present time is how to get rid of that water when we are done with it, together with its accompanying solids. In too many instances it is poured into rivers and harbors at the nearest point, there to pollute all waters that come in contact with it; in fact, making some of our rivers and harbors veritable open sewers, with their slimy banks exposed at every lowering of the tide, charging the atmosphere in the vicinity with germs that contribute to malarial and other fevers.

The time may be ripe in some localities for considering some feasible plan for removing the cause of this growing evil, whereby all sewage will be finally discharged several miles away, and as far as circumstances will permit from the habitations of man. This method of disposal undoubtedly involves great waste of material which might be utilized, and which, if treated in some other way, might become a boon to the farmer as a fertilizer. Science by the aid of heat or electricity may yet find means to cheaply convert this material into a valuable adjunct to some of our manufacturing industries.

GOOD DRAINAGE.

A third important consideration in the construction of dwellings is to secure good drainage. The function of a drain is to carry to its destination as speedily as possible all waste that can be removed by the use of water. It is of vital importance that the air in the drain should not be allowed to escape, except at such points as are specially provided. Soil, waste and drain pipes should unfailingly be air tight and water tight, having as great a fall as possible, evenly laid throughout and supported firmly in position.

Sanitation and hygiene imply cleanliness in all things pertaining to the house, and that the plumbing shall be perfect, as far as science and present knowledge of sanitary matters can secure. All soil, waste and vent pipes and their fittings inside of the house and for several feet outside of it should be heavy cast iron pipe carried to their several points convenient for the connection of fixtures, with as little horizontal pipe under the floor above the cellar story as possible; all pipes being exposed where practicable, and placed in such position as to be readily got at when necessary. All connections of one waste pipe with another should be in the form of a Y branch with a sufficient number of screw or bolted clean out openings to control the system of drain pipes.

Sanitary house drainage consists largely in the use of good materials and doing the work in a thorough and substantial manner, according to sanitary principles—viz.: Place a trap on main drain pipe, either in the cellar, near the front wall, or outside of the building, with access to either by a man hole. Place a fresh air inlet on house side of trap carried up on outside of house above the main roof or above the surface of the ground at a safe distance from the house. All rain water conductors should run up on the outside of building and be properly trapped. Extend all soil and other vent pipes full size up to the roof and increase size slightly above the roof.

Trap each fixture separately and as close to its discharge outlet as possible. Ventilate each trap by pipe of the same size as the waste pipe Ventilate from under each water closet seat by a 4-inch galvanized or copper pipe connected to a hot flue, or the draft may be created by an electric fan placed in said vent pipe. Leave a 4-inch opening in pipe at back wall under the seat with the pipe from the vent horn of bowl entering it and carried above hight of closet bowl. The remaining space not taken up by vent horn pipe is for additional ventilation.

In addition to local ventilation of water closets, ventilate by a proper draft system all the other fixtures in the house, especially slop closets and all basins in sleeping rooms between discharge opening of fixtures and the water in the trap; each fixture so arranged will then become a ventilator to the extent of the size of its outlet. Use the best plumbing fixtures with little or no wood work and set them on floors impervious to absorption.

Place a flush tank in attic above all fixtures, holding about 100 gallons, and near each line of soil pipe, with a 4-inch plug outlet, for the purpose of scouring out at intervals as much of the soil pipe and cellar drainage as possible.

Place a small receptacle under refrigerator with standing overflow bell trapped plug, the socket of plug flush with the floor, with waste from it emptying into the sink below, all put together in such a way as to be easily taken apart and cleaned. When this is not practicable, the safest way is to empty the vessel when necessary, rather than connect with the sewer direct.

When work is doneaccording to the sense of the above explanation there can be no pressure of foul air against the water in the traps from the collections that gather on the inside of all waste pipes. The traps cannot be syphoned out and there is no noise from one fixture to the other when either is discharged; and, furthermore, the plumbing will be absolutely free from impure air.

All clothes closets shonld be ventilated, and with hardwood floors and painted walls, the house may easily be kept supplied with sweet and clean air.

PLUMBING REGULATION.

There should be an inspector of plumbing in every town where there is a system of sewerage, to see that the health of the community is not endangered by the work of

unskillful plumbers. He should be a man of integrity who will honestly strive to have the plumbing laws rigidly enforced. He should also have been a practical plumber, one who has learned the trade and is familiar with all that appertains to sanitary house drainage. He should pass an examination before a local or State board of examiners who thoroughly understand sanitary plumbing. Again, all persons engaged in and those about to engage in the plumbing business should pass an examination before an examining board composed in part of competent plumbers who fully understand house sanitation. The above has reference chiefly to thickly populated districts.

The prospects in the near future for the energetic and skillful young plumber are grand and can scarcely be overestimated. Now that railways traverse this country from north to south, and from east to west, bringing communities closer together and opening up new towns, cities and villages, each competing with the others in the introduction of modern improvements, the plumber is called to let loose the pure waters from the land locked mountain lake, and from under the surface of the level plain, and to distribute it by a system of pipes and other appliances, requiring skill and mechanical ability to secure the ends sought, and deliver it to the householders and the "hives of industry," not only as one of the great necessities, but also as one of the greatest luxuries and comforts of life.

With good ventilation, pure air, pure water and perfect drainage, the incandescent lamp for light and indirect heat for warmth, all the conditions are right for health. A more general diffusion of knowledge in sanitary matters and a closer investigation on the part of property holders will result in raising the standard of health and lowering the death rate. When the public knows that sanitation insures greater freedom from sickness and consequent increased enjoyment of life, it will then regard the plumber as the health officer of the home, and the integrity of the man and the honesty of his work will be considered before a saving in cost of construction, and the family physician and the family plumber will stand side by side in the estimation of the householder.

Ohio Master Plumbers.

The annual convention of master plumbers of the State of Ohio was held at Toledo, February 13 and 14. It was called to order by President L. Poplowsky, and an address of welcome was made by J. A. Waite, president of the local association. After appointing the Committee on Credentials and Auditing Committee the convention adjourned. At the afternoon session Secretary Dewstoe's report showed a membership of 152, and 17 new members were added. The membership came principally from the smaller towns. The treasury was found to be in a good condition, showing a balance of over $100. At the morning session the following officers were elected for the ensuing year: President, Robert Raitz of Toledo; vice-president, E. A. Futerer of Columbus; recording secretary, T. L. Meissner of Toledo; financial secretary, E J. McNamara of Columbus; treasurer, Wm. Halley of Columbus; Executive Committee, ex-President Poplowsky of Cleveland, J. A. Gibson of Cincinnati, H. M. Stowe of Marion, Herman Appell of Sandusky.

At the afternoon session, on learning of the death of the first president of the association, the following resolutions were passed:

This association learns with sincere regret of the death of Edward A. Dean of Cincinnati, who was its first president. Therefore, be it

Resolved, That we testify in this manner to the grief we feel at his untimely death, and to our appreciation of the untiring zeal and far-seeing judgment with which he assisted in organizing the Ohio State Master Plumbers' Association. Also be it

Resolved, That these resolutions be spread upon the minutes of this association, and a copy furnished to the family of the deceased.

The association, after debate, decided to take no action on the apprentice question, which was brought up. Many other questions relating to the interests of plumbers were discussed. In view of the fact that a bill to govern plumbers and plumbing, similar to the Massachusetts law, will be offered at the next session of the Legislature, Vice-President Futerer's invitation to accept the hospitality of Columbus was accepted, and the next convention will be held in that city. The visitors were entertained by visits to institutions, drives, concerts and theater parties.

The Next National Convention.

The date for holding the twelfth annual convention of the National Association of Master Plumbers was set, at the recent session of the Executive Committee at Boston, for June 19, 20 and 21. The convention meetings will be held in Philharmonic Hall, Detroit, Mich., and the Cadillac Hotel will be headquarters. James Meathe, president of the Detroit Association, was present by invitation, and all arrangements necessary will be made for a speedy transaction of the business of the association and the entertainment of the delegates.

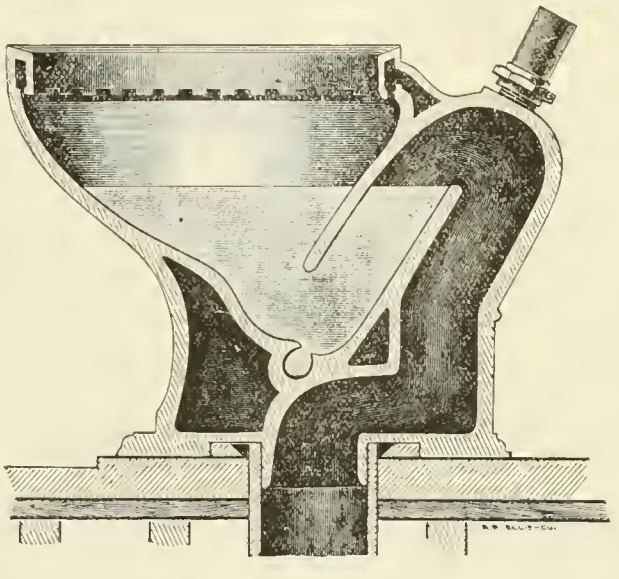
The Humboldt Syphon Closet.

We show in the accompanying illustration a sectional view of the Humboldt syphon water closet, made by Sumner & Goodwin, 15–21 Oliver street, Boston, Mass. This closet is said to be the outcome of the demand for a simple deep seal bowl that will flush out quickly and noiselessly, and will operate under any of the conditions that the wash out closet is adapted to. The water closet is all porcelain, the bowl of which contains a sufficient quantity of water when at rest to form a seal or trap of unusual depth and provide an effectual barrier against the passage of sewer gas. The design of the Humboldt is the result of a series of severe practical experiments. It contains neither weir nor lower trap, and in action it is said to be prompt and strong, as well as almost noiseless. Furthermore, it can be operated under any tank or valve. The Humboldt is made oval and square in a variety of styles and finishes.

Examinations in Plumbing.

From M. E. D., *Brooklyn.*—I read with interest the Letter Box of *The Metal Worker* and would like to have answered the sixth question in the "Examinations in Plumbing" that appeared December 30: "Sketch various forms of defective traps with which you are acquainted and also improved kinds you would recommend in place of same." Also the first portion of question No. 5 of the honors grade: "A water pipe running alongside a leaking drain receives an injury; describe the circumstance under which sewage can be sucked into the pipe at the point of injury while the pipe is charged with water."

Answer.—In printing the list of questions on which English plumbers are examined it was not our intention to be examined. Defects in traps are explained in "House Drainage and Sanitary Plumbing," a small work which can be obtained from the book department of this office. Sewage may be drawn into a water pipe which has a hole in it when the supply pressure is very low and the outlet taps are opened to reduce it more; then the pressure of the sewage inward on the pipe would be greater than the pressure of the water outward. Such a condition can be created by using a pump to raise water to upper floors of a building. Then the raising of the piston would tend to create a vacuum that would be filled by the entrance of the sewage.

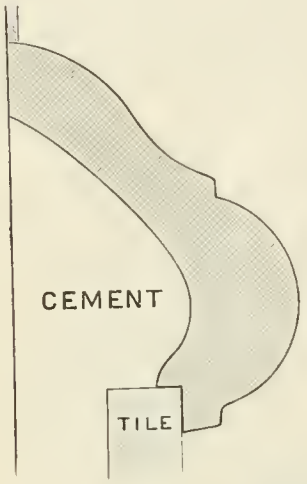


Sectional View of Humboldt Syphon Closet.

The Hollands Mfg. Company, Erie, Pa., are sending out their seventh annual catalogue of vises, machinists' and plumbers' tools and natural gas burners. They call special attention to their self-adjusting swivel base vises and hinged pipe vises. A number of pipe wrenches, tongs, cutters and threading tools are shown and a variety of gas burners, some specially adapted for use in cooking stoves.

Tile Molding or Binder for Tile Walls.

The J. L. Mott Iron Works, 84-90 Beekman street, New York, are now offering their own patent tile cap or binder molding for tile wainscoting, as here shown in Figs. 1 and 2. This



Tile Molding or Binder for Tile Walls.
—Fig. 1.—Sectional View of Molding, Showing Method of Binding Tiling.

cap is the result of a number of trials and experiments looking to a satisfactory method for finishing the tops of tile wainscotings in bathrooms or elsewhere. It combines a fastener for the top course of tiling and a cover to conceal the cement used in setting the tiles. From the fact that the lower edge of this cap is recessed, any slight irregularities in the top of the upper course of tiles are covered. The top of the cap being arranged to cut into the plastered wall above tiling permits the white finish coat to lap over the edge of the cap, thereby insuring the permanency of the cap and binding the whole wainscoting to the wall. They supply angles of the same type for turning corners. This concern have in preparation a number of cap moldings on the same principle, which will be ornamental in character, and of which they will soon be in a position to furnish designs and prices. The moldings now ready are in white or ivory tint. Referring to imported wall tiles in general, they add that their experience has been that only small quantities have been imported and kept in stock by dealers. To overcome this great inconvenience and annoyance to the trade, who often cannot wait for tiles to be brought out on importation orders, they are making a specialty of keeping constantly on hand a large assorted stock of these goods from which to execute orders promptly.

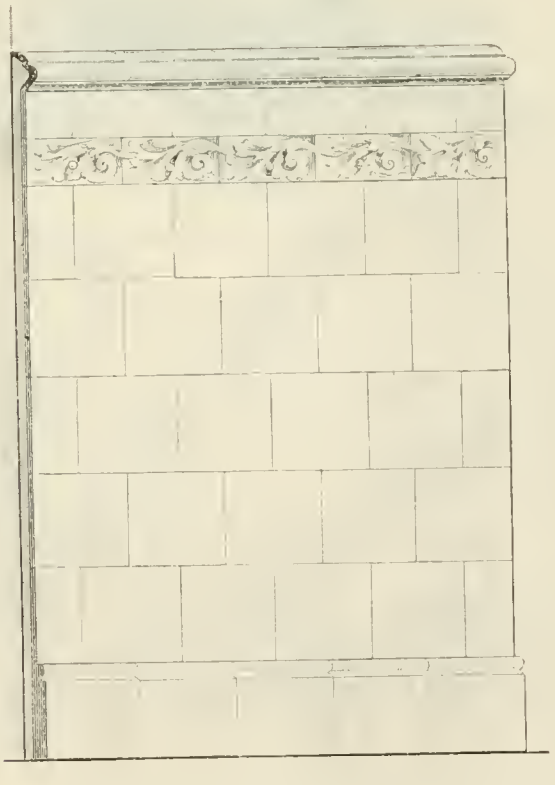


Fig. 2.—Front View, Showing Cap in Position.

TRAPS AND VENTS.

EDWARD MCGOWAN, secretary and treasurer of the Master Plumbers' Association of Memphis, Tenn., writes us that their association was recently formed and is a member of the national body. All the plumbers in the city, with one exception, are members and now a set of plumbing regulations are before the City Council that are likely to be adopted and which it is believed will be of great benefit to the city at large.

GEORGE BISHOP of the plumbing class of '93 of the Pratt Institute of Brooklyn has succeeded his father at 205 South street, New York. He passed the examination before the New York examining board. He has a contract for plumbing on the new cruisers being constructed by the United States Government.

AN ATTEMPT is being made to evade the Massachusetts plumbing law by a journeyman plumber buying his material of some master plumber who will file specifications of the work and enable the journeyman to do the work at the cost of his wages. This plan comes from Waltham, but it is hardly probable that the journeyman plumbers as a body will approve of any such scheme.

A FIRE in the basement of Allen Black's plumbing and gas fitting establishment, 317 Minnesota street, St. Paul, Minn., last week, resulted in a loss of $2700, fully covered by insurance.

ARCHIBALD BUCHANAN of the Pratt Institute, Brooklyn, plumbing class of '92 has entered into partnership with his father on Fulton street, Brooklyn.

EDWARD LAWLOR, Hartford, Conn., has not confined himself to plumbing alone, but has taken out some patents on inventions, one of which is for a regulating gas burner.

J. J. WADE of Chicago, who learned his trade at Hartford, Conn., was one of the guests at the recent plumbers' convention of the State Master Plumbers.

LANGDON & DALEY, Hartford, Conn., are a firm of plumbers who started in the fall and have done the plumbing work in a number of residences.

R. S SCHADD & BROTHER, steam fitters and plumbers, have leased for three years the store at the northeast corner of the diamond, and will have the same fixed up as a show room, while a workshop will be arranged in the basement.

JOHN F. BRADY, a Bridgeport, Conn., plumber, was recently hurt in a runaway, Mr. Brady being thrown out of the sleigh.

THE NEW PLUMBING FIRM of Ames & Sheffield have opened a store at 151 Main street, Waterville, Maine, and keep a good supply of bathtubs, plumbing materials, &c. Mr. Sheffield has had an experience of 17 years in the plumbing business.

S. S. CHAPMAN, who takes the Western circuit for Meriden Malleable Iron Company, Meriden, Conn., has started out with their large line of plumbers' goods, which embraces a variety of brass brackets and slab supports.

A SYSTEM OF coin-in-the-slot gas meters, by which a stated number of feet of gas are supplied on the insertion of a coin in the meter, is being introduced in New York City by the Consolidated Gas Company. The plan has already achieved success in England, where it has been in use during the past year.

THE BOARD OF HEALTH of Los Angeles, Cal., have approved a set of plumbing regulations and recommended them to the Council for adoption.

JUNE 19, 20 and 21 have been selected by both the Master Steam and Hot Water Fitters' Association of the United States and the National Association of Master Plumbers for holding their conventions, the former being at New York and the latter at Detroit. Many would like to attend both conventions as they did last year, but this is now impossible.

AT THE ANNUAL MEETING of the Master Plumbers' Association of Buffalo, N Y., held at the Builders' Exchange February 14, the following officers were elected: President, J. S. Stygall, Jr.; vice president, S. B. Stewart; secretary, Frank L. Beyer; treasurer, Charles F. Mensch. Trustees: C. Brenner, Edward L. Cook, George Engel.

C. J. LEARY, Monson, Mass., is to build a new store for his stove, tin and plumbing business.

James Meathe, president of the Detroit, Mich., Association of Master Plumbers, was a delegate to the convention of the National Association of Builders, at Boston, and was elected second vice-president.

Frank M. Palmatier, Cobleskill, N. Y., informs us that he has no intention of changing his business location, as has been reported.

E. J. Brady, 58 Warren street, New York, has added gas fixtures to the line of goods he handles in connection with his plumbing business.

It is reported that some plumbers get the best of the city of Chicago by clubbing together and raising the necessary $25 to procure a license, which is taken out in the name of one man and whose name appears as running as many as 30 shops, so that all do business under one license and effect a substantial saving.

Michael F. Carmody, plumber, has moved to the Stevenson Building, 7 North Fourth avenue, Mt. Vernon, N. Y.

John M. Thompson, a plumber and gas fitter, until recently in the employ of Jos. Johnston's Sons, will start a general jobbing shop on Washington avenue, Washington, N. J.

One of the delegates to the Ohio State Convention of Master Plumbers from Canton had a piece of common tin pipe—eave troughing pipe—that was made in the shape of a trap, which had been placed in a costly building in that town and palmed off on the owner as a first-class job of plumbing.

The plumbing trade will be pained to hear of the death of Lawrence Shuster, Jr., of the Shuster Foundry, Philadelphia, makers of Shuster's Sure Seal specialties. Mr. Shuster died at his home in Philadelphia on the 19th inst. We hope to present a sketch of his life in our next issue.

The Chicago master plumbers held a special meeting at their rooms, 197 Madison street, Friday evening, February 16. After due discussion the motion to adopt the apprenticeship code was not concurred in.

James Hastings, plumber, Newburg, N. Y., had made extensive alterations and improvements in his store. Among the specialties shown is a new mode of ventilating waste pipes.

Steel Wire Pipe Hooks.

The cuts here shown illustrate steel wire pipe hooks and methods of using them, as offered by John W. Bell &

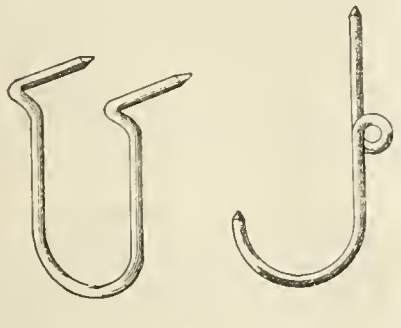


Fig. 1.—Steel Wire Pipe Hooks.

Co., Mercer, Pa. In Fig. 1 the two styles are shown — staple and open hooks. It is stated that the hooks are made of a superior quality of steel wire, tough yet stiff, and that they can be

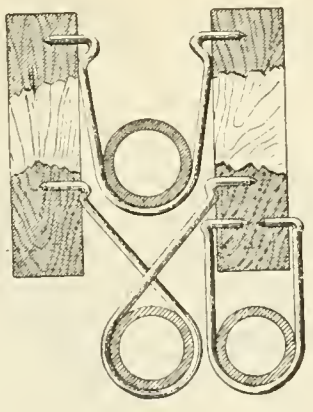


Fig. 2.—Methods of Using Hooks.

driven into any material into which a wire nail would drive. It is explained that the hooks are neat and strong, and that they can be used in many ways which will be suggested to the practical workman by the peculiar circumstances of each particular case. The hooks are designed for fastening gas, water, steam and soil pipe, and are made to suit pipe from ⅜-inch to 8 inches, and of various lengths, the size of wire used varying according to the size of the hook.

The firm of Collins & Dunwoody, tinsmiths and plumbers, Waterford, N. Y., was dissolved February 18. Mr. Collins will continue the business.

At a meeting of the Master Plumbers' Association of Poughkeepsie, N. Y., held on February 19, the following officers were elected: President, P. C. Doherty; vice-president, William H. Ritter; treasurer, Peter Adriance; secretary, William Ward. Delegates to State convention: P. C. Doherty, Thomas A. Waters, Henry J. Maar, Charles Cooke. Alternates: Charles H. Shurter, William Ward and William H. Ritter.

New and Notes.

From Ottawa, Canada, it is officially announced that the Dominion Government has decided to discontinue after March 1 the payment of bonuses to European immigrants taking up land in the Canadian Northwest. It has not been found that the system has had any appreciable effect in inducing immigration.

Over $1,000,000 of the capital stock of the Old Colony and Interior Canal Company has been subscribed for, but ground will not be broken until $2,000,000 is subscribed, so as to insure the plans for the new Cape Cod Canal being fully carried out. It is expected that the work will be completed within two years.

It is announced that the original copy of the Declaration of Independence, preserved in Washington, will no longer be placed on public view. It has been found that the text of the document is gradually fading from exposure. Not long ago it was discovered that a similar cause had rendered the original charter of the Commonwealth of Massachusetts almost illegible.

Captain McDougall, the inventor of the whaleback type of vessel, has submitted plans to the Government for a whaleback war ship. It is reported that the idea is likely to be tried on the lakes by the construction of an experimental vessel of this type.

A boom in Mexican coffee lands is in progress. Millions of acres are said to have been acquired by American and English speculators.

A bill, promoted by the Produce Exchange of New York City, has been introduced into the State legislature calling for an appropriation of $1,000,000 for the improvement of canals.

Secretary Carlisle is credited with the purpose of doing away with the illumination of the Statue of Liberty in New York harbor for reasons of economy. It is claimed that the lights on the statue, which cost the government $10,000 a year, are not necessary for pilotage purposes. In shipping circles, however, the proposal meets with much disfavor, and it is generally hoped that this economy will not be pressed.

Scarcity of fuel caused much suffering and many deaths among the settlers in Western Kansas and the adjoining Territories during the late severe weather. Some of the railroads have offered to convey coal free to the districts where the greatest destitution prevails.

A New York wrecking firm has made an offer to the Navy Department to save the wreck of the corvette "Kearsarge," now lying on Roncador Reef. Nothing will be done, however, in the matter until the arrival of Admiral Stanton and the late officers and crew of the vessel, who are expected home this week.

France's foreign trade has fallen off to the amount of $228,480,000 in the last two years. The returns for 1893 show, for that year, a decrease in imports of $48,257,000 and in exports of $48,695,000.

The Architectural League of New York City, at a meeting held last week, supported a motion, introduced by the president of the league, condemning the erection of sky-scraping buildings, on hygienic grounds, and also on account of their inherent ugliness. They will draft a bill for introduction in the legislature dealing with these structures.

It is rumored that the Stability Board, of which Admiral Walker is head, and which was originally formed to inquire into the faults in some of the new war vessels, will be retained as a permanent feature of the Navy Department.

A recent estimate of the unmined anthracite coal of Pennsylvania places it at 4,000,000,000 tons. Of this total the Reading coal fields are credited with more than one half.

The Riverside Association of New York City has taken a sensible step toward providing work for the unemployed by addressing a letter to all householders on the west side, urging the execution of necessary repairs on their houses now, instead of putting off the work until the summer. They have, moreover, created a labor exchange, where people who have work to be done can secure trustworthy men to do it.

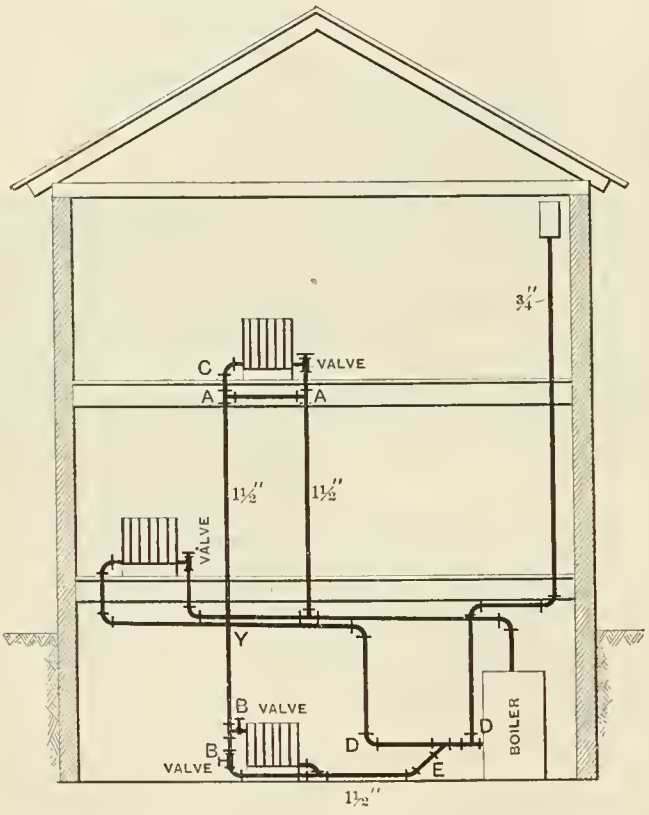
STEAM AND HOT WATER.

Radiator on Boiler Level.

The following letter is received from J. J. Wilson, heating engineer, with the Fuller & Warren Company, Troy, N. Y.:

In *The Metal Worker* of January 27 I notice a plan of heating radiator at boiler level, by A. C. Edgar, Philadelphia. The plan followed is to be commended for the minimum amount of pipe used. I, however, desire to call attention to a couple of changes which I think would insure a more perfect working job. In Fig. 1 of the accompanying illustrations, at point marked A A, where the by pass between the flow and return pipes on radiator on top floor is used as a syphon, when the radiator is closed there is no relief for air, which will surely collect when radiator is cut off. At point marked Y on the return pipe from radiator on top floor a better arrangement of pipe can be made. Fig. 2 explains my method of connecting syphon with air relief, which can be carried to tank, connected to air relief of the radiator, or be brought up by the side of radiator, with an independent air cock. This will prevent air binding and facilitate flow. Fig. 3 shows how branch can be taken off at point marked Y in drawing, Fig. 1, from the return of radiator on top floor and connected to the return of radiator on first floor, dispensing with all pipe below the valve on radiator at boiler level. When it is desired to cut off radiator at boiler level close the radiator valve and open the gate valve on the branch from the return of radiator on top floor. This valve is necessary to prevent water from making short circuit when it is desired to heat radiator at boiler level.

In regard to success in using syphons for heating radiators at boiler level, I have arranged a number of jobs in this way, with four and five radiators at boiler level and all are giving entire satisfaction. These jobs are in the cold climates of the Eastern and Western States. I have two combinations in a large barrel factory near New York.



Radiator at Boiler Level.—Fig. 1.—General Arrangement.

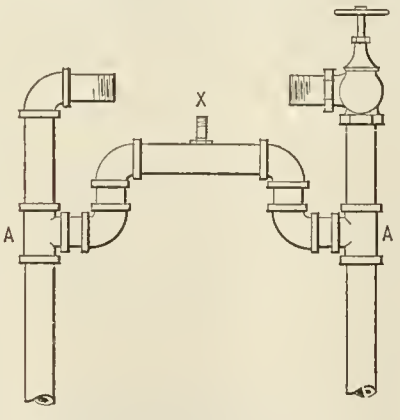


Fig. 2.—Proposed Change Under Hightest Radiator.

The warm air is used to heat the shops and the hot water is used in coils, placed in vats of water to warm same for soaking barrel hoops. These coils are at least 3 feet below the boiler level, and at point where the return turns up to enter the boiler the distance is fully 4 feet below boiler level; yet I am able to maintain a strong and positive circulation. A peculiar feature of this work is that the expansion tank is on the main flow pipe, the work not being done on a syphon. In using a syphon it is far preferable to carry air relief to expansion tank, connecting by a tee with air relief pipe of tank, instead of connecting tank direct to syphon, as this often causes boiling and overflowing of water in tank, requiring extra attention in the matter of supplying water to the system. The above plans can be used for general system of work in *The Metal Worker* of January 20.

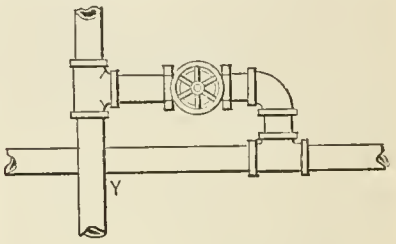


Fig. 3.—Proposed Change in Return.

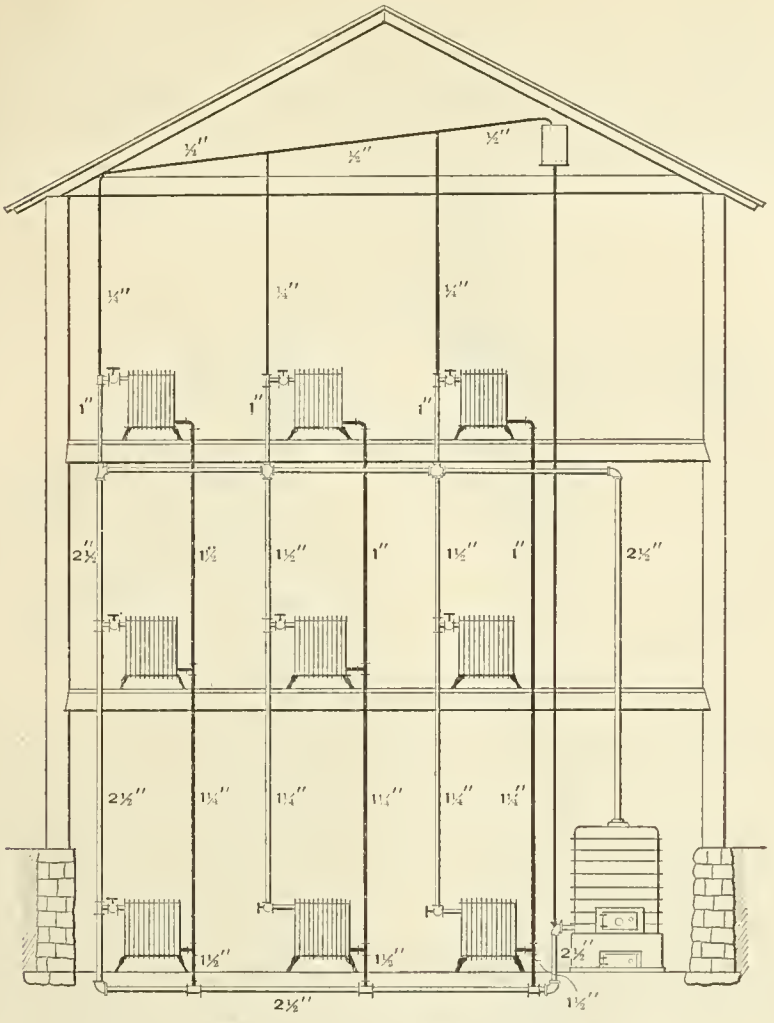
Piping a Hot Water Job.

From W. M., *Titusville Pa.*—I submit Fig. 1 as a better plan, I think, to connect the radiators with the boiler than the one shown in *The Metal Worker* of January 20, in reply to "R. E. M." of Philadelphia, Pa.

Fig. 2 shows a plant that I put in a house three years ago, which shows that my plan may be extended and adopted to suit any condition that is liable to occur, and while I have never put the plan to any test further than is shown, I would not hesitate to extend the system as far below the boiler as it is above, and feel confident of getting a good circulation. The apparatus has been in use three years and under my own observation all the time; in fact the main object of putting it in was to watch for and remedy the defects. I have found none yet, and as for economy in fuel and attention, and for a house of this class, it is far ahead of anything I have ever seen. There is only a difference of from 10° to 12° in temperature in the main pipe at B and A, and the two stacks of indirects, of 80 feet each, shown under the parlor and hall floor, are within 8° of being as warm as the direct radiators on second floor.

HEATING NOTES.

George B. Cobb & Co. announce, under date of February 19, that they have removed their business office from 42 Duane street to 96 Centre street, New York. They propose to use their former store entirely as a workshop, which additional facilities to their mechanical department will enable them to handle their increasing business better than heretofore. The removal



Piping a Hot Water Job.—Fig. 1.—Showing Suggested Plan.

notice accompanies a catalogue that they issue in the interests of the Florida system of heating. The circular, of oblong shape, is neatly bound and published and begins with an interesting dissertation on the several artificial modes of heating, ending up with pointing out the particular advantages of the steam and hot water heating systems. Following this are engravings of some handsome buildings that have been heated by Cobb & Co., while at the close is information that will be read with profit by all who are concerned with the business of warming buildings. In referring to the annoyance often caused by the snapping and hammering sounds from heating apparatus, the author of the catalogue says, very cleverly: "This is simply a vigorous protest of the dumb apparatus against the workmen who erected it, as it is the best evidence in the world that the apparatus is not properly erected and is entirely the fault of the constructing engineer or his men."

JOHN TOWLE AND R. REED of the H. B. Smith Company, Westfield, Mass., were in Hartford, Conn., during the plumbers' convention renewing acquaintances.

BARLOW, BROS., Waterbury, Conn., are showing a 127 Victor for hot water to customers interested in heating. They have installed a number of satisfactory heating plants during the season.

DAVIS, WRIGHT & Co., Keene, N. H., are rearranging their sample room, showing a 317 Richmond for hot water and a 44 Victor, a 21 Richmond and a 320 Richmond Sectional for steam.

G. M. DAVIS & Co., Chicago, manufacturers of steam heating and regulating specialties, have recently moved their Eastern office to 136 Liberty street, New York, and are issuing a catalogue of their goods.

THE PHEASY TUBULAR BOILER COMPANY are to be organized in Cleveland, Ohio, and, it is reported, with a capital stock of $100,000. Thomas Pheasy has invented a new horizontal tubular low pressure boiler for residence and greenhouse heating. The first boiler built has been tested in the private greenhouse of F. E. Dellenbaugh, and found to be a success. The stock company are to be formed and extensive works erected in Cleveland for the purpose of manufacturing the boiler.

H. GILBERT HART of Hart & Crouse, Utica, N. Y., spent a few days this week in New York, making his headquarters with W. M. Mackay, at 211 Water street, where the Royal line of heating apparatus is displayed.

THE WELLS & NEWTON COMPANY, Chicago, have moved into their new office at 274 Dearborn street, Monadnock Block.

H. P. BLAIR and D. A. WESTBURY have formed a partnership under the name of H. P. Blair & Co., and have rented the store at 118 Colfax avenue, South Bend., Ind. The firm will do a general business of ventilating, steam and hot water heating, and deal in gas fitters', plumbers', machinists' and engineers' supplies.

THE ATLANTIC AUTOMATIC GAS HEATING & REGULATING COMPANY, Camden, N. J., with Philadelphia office at 403 Market street, distribute circulars illustrating and describing the Ware automatic gas heat generator and regulator, also the Ware automatic fuel gas controller, as well as Ware's

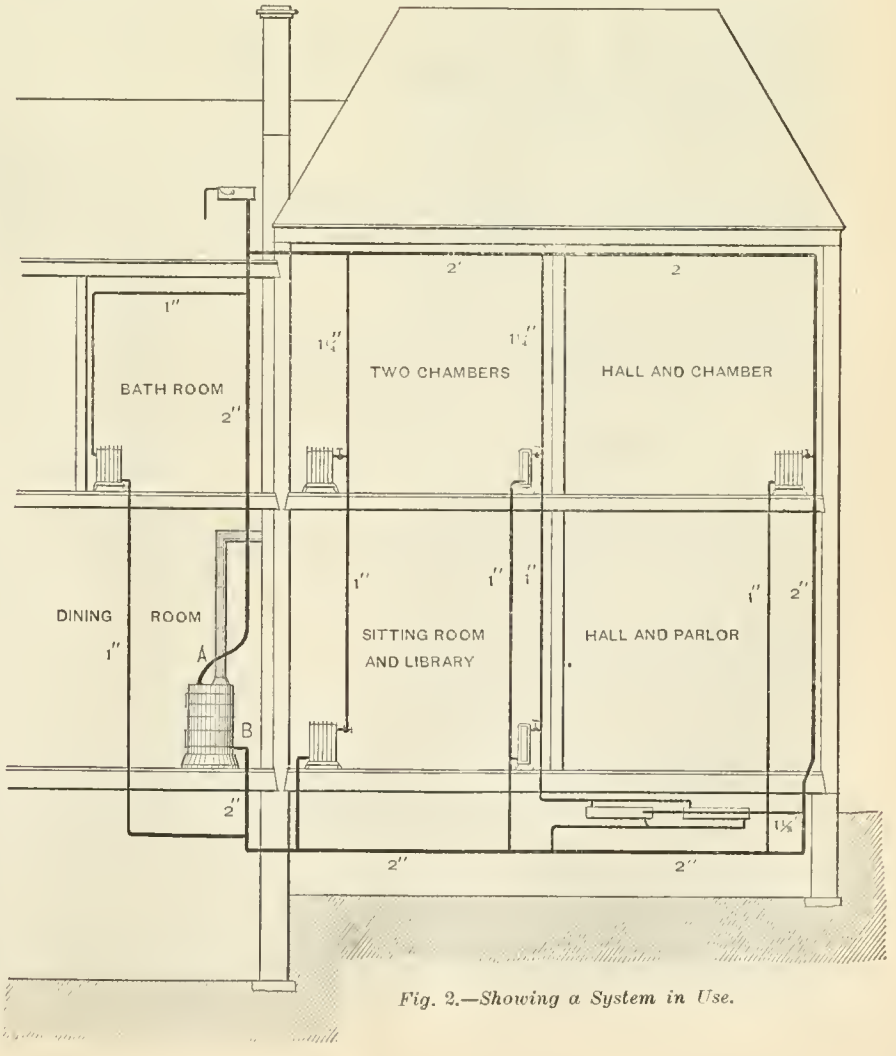


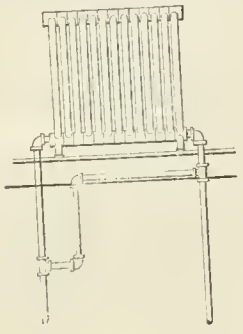
Fig. 2.—Showing a System in Use.

improved thermostat and thermotic circuit closer. The apparatus are illustrated and described in the circular, and on a separate sheet a calculation is presented that will interest those who are concerned with heating apparatus.

W. C. HIGGINS of the Richmond Stove Company, Norwich, Conn., was the guest of A. S. Mappett and Albert Cryer & Co., 85 Center street, New York, last Wednesday and was well pleased with the display made of the Richmond and Victor steam and hot water apparatus.

Cold Water Checked by Hot.

From M. M. W., *New York.*—Having read with interest the comments in *The Metal Worker* on "Piping a Hot Water

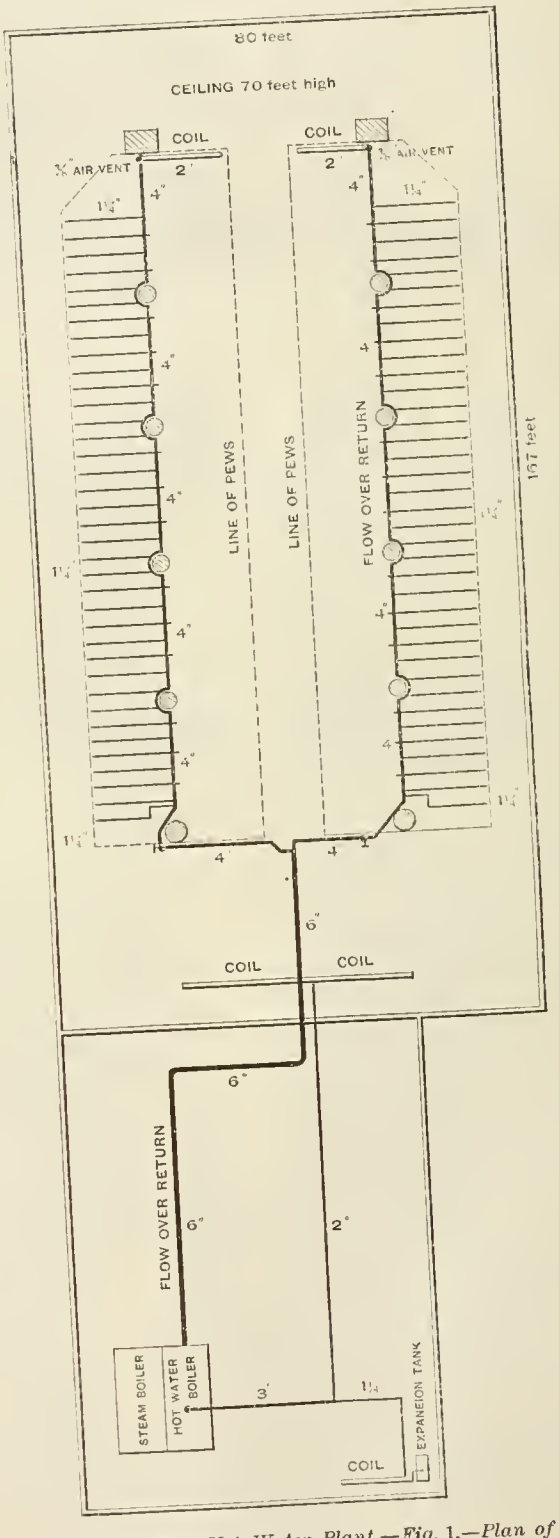


Cold Water Checked by Hot.

Job" and "Radiator on Boiler Level," I contribute this item from my experience. I have found the end loops of a radiator hot and the center loops cold when the flow and return were connected just below the radiator. This, I believe, is due to hot water holding the cold water in check, which possibility is disputed by some. In operation the hot water passes up the pipe into the radiator, but the movement is not fast enough to take care of all of the hot supply, so some runs through the connection below the radiator and enters the radiator at the return end. Such an action interferes with the heating of the radiator and causes dissatisfaction. I have remedied such troubles by connecting, as shown in the illustration, the drop in the cross connection before it receives the return from the radiator, preventing the cold water being held in check by the hot water.

An Interesting Hot Water Plant.

Owing to the lack of heat and excess of noise from the steam heating plant in the Church of the Most Holy Redeemer, at 173 East Third street, New York, an effort was made to secure something more satisfactory. On consulting W. M. Mackay, 211 Water street, New York, the plant here illustrated and described was decided upon and installed by Albert A. Cryer & Co., 85 Centre street. Under a building adjoining the church there were two 40 horse-power steam heating boilers, one intended for heating the church and the other the school and residence connected with it, but in cold weather both had failed to make the church comfortable. One of the boilers is now used as a hot water apparatus, as shown in Fig. 1, with a 6-inch flow pipe taken from the back of the boiler and run to a point under the church, where it rises and branches, as shown, into two 4 inch flow mains, one running to each side of the church. To economize space these mains pass beneath the partitions between the pews and had to run around five pillars 30 inches in diameter and extending across two pews. A special casting, shown in Fig. 2, was made to meet this requirement, having a 4-inch waterway, a 1¼-inch outlet on the side, and flanges on the ends for joining together and connecting with the pipes, two castings being necessary to pass the pillar. The main flow throughout the plant is directly above the return, and as both had to be placed below the seats, they are run nearly level, the flow having a slight fall from the first pillar and the return having a slight fall toward the boiler. From alternate crosses and tees in the mains and openings in the pillar castings a 1¼-inch pipe runs, with all from the main, under the seats of the outer row of pews, and the return, instead of being beneath, is alongside of the main, with a slight fall toward the return main, until it nearly reaches it, when it drops down and connects. This arrangement of the piping was necessary to avoid interfering with the feet of the kneeling worshipers. The crosses are plugged, and were used so that more heating surface could be added if found necessary. The flow mains terminate in 2-inch coils, 6 tiers high, behind the middle pews at the entrance of the church, as shown in Fig. 1, and connect with the return main. From the top of the coils ¾-inch pipes run up, behind an arch, with an open end to a point above the level of the expansion tank, afford-



An Interesting Hot Water Plant.—Fig. 1.—Plan of Church.

ing an air vent for the system, so that no air valves are used. The pipes beneath the seats are supported by a hanger, shown in Fig. 3, and were adjusted by placing a piece of wood of the proper thickness between the hanger and the

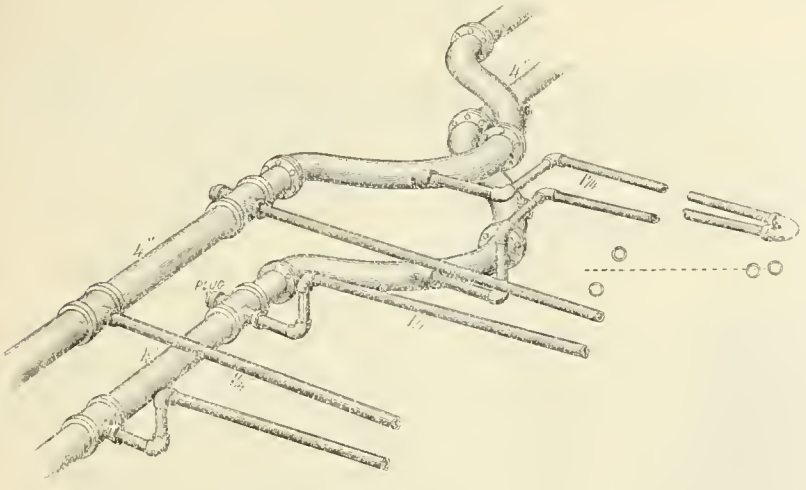


Fig. 2.—Flow and Return Mains Around Pillar.

seat. Referring again to Fig. 1, it will be noticed that a second 3-inch main runs from the top of the boiler and branches, a 2-inch pipe running to a coil behind the altar and a 1¼-inch pipe running to a coil in another building, to which the expansion tank is connected. As soon as circulation begins in the 4-inch flow mains under the partitions, the almost imperceptible decline, and the gradual cooling of the water makes the entire system a return and with a temperature of 160° at the boiler the whole church is satisfactorily warmed and a substantial saving in labor and fuel effected. In addition to 200 feet of 6-inch pipe

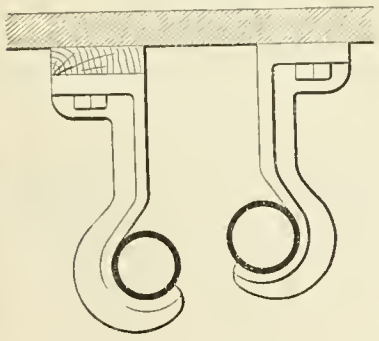


Fig. 3.—Pipe Hanger.

used in the flow and return about 400 feet of 4-inch, 300 feet of 2-inch and 2000 feet of 1¼-inch pipe are used for radiation. The successful heating of so large a church with so many obstacles and so little pitch makes the plant and the method of its installation of more than ordinary interest.

The Smith & Winchester Company of Boston, Mass., are about to place a new steam and hot water heater on the market for the coming season, and have adopted a novel way for selecting the name. The company are sending out circulars to get the opinions of all the trade upon the most suitable name. The suggestions will be submitted to a board of judges, consisting of L. A. Hart, manager of *Heating and Ventilation*, the editor of *The Metal Worker* and E. R. Pierce, manager of the Boston office of the American Radiator Company. The contest will close March 15, 1894, and the person selecting the name decided upon by the judges will be presented with one of the new heaters for steam or hot water.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

David Horn, 211 West Market street, York, Pa., has been awarded the contract for the plumbing, tiling, tin and copper work for the new building of the Security Title & Trust Company, in that city.

The contract for heating the Agricultural Building, including the museum, at Raleigh, N. C., has been awarded to Allen & Cram of that city.

The Vanderman Plumbing & Heating Company, Willimantic, Conn., are installing the heating plant in the Normal School of that city, using the blower system and two 60 horse-power boilers. They are doing the plumbing and heating in the Murray Block, using a 60 horse-power boiler.

Ernest Franz will erect a three-story and basement flat building at 4217 Wabash avenue, Chicago, covering an area of 22 x 60 feet. It will have walls of stone and brick, plate glass, lavatories, hardwood finish, mantels, bells and modern plumbing. It will cost $9000.

Sidney S. Niles will erect a three-store and flat building, 25 x 65 feet, on South boulevard, in Oak Park, Chicago. It will be heated by steam and lighted by electricity. It will cost $10,000.

The Easton Heating & Ventilating Company, Easton, Pa., were awarded the contract at $412 to install a hot water heating plant in Engine House No. 3 of that city.

W. E. Bouillon, Lincoln, Ill., has been awarded the contract for fitting up the second floor of Casey's Building with the latest and best plumbing fixtures.

Trimble & Lutz, Wheeling, W. Va., have recently completed a heating and plumbing contract of $66,000 in the new hospital for the insane at Spencer. The plumbing is complete and efficient, a feature being catch basins in the drains for the removal of articles that may be put in the fixtures by the patients.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until March 14, for work including plumbing and conduits for electrical wires in the United States Post Office building at Staunton, Va. Drawings and specifications can be obtained from the Supervising Architect, at Washington, or may be had from the superintendent at Staunton, Va.

Some of the recent contracts closed by Thomas Weathered's Sons, 244 Canal street, New York, are for the erection and heating of a $7500 greenhouse for J. C. Hoagland, Seabright, N. J.; two greenhouses, one 100 feet and the other 80 feet long, for Waldemar Barth, Bayone, N. J., and rearranging the heating plant and installing one of their No. 6 boilers in the conservatories of Mrs. J. C. Meyers, Yonkers, N. Y. They are also building a conservatory for Gen. John B. Woodward of Brooklyn, N. Y.

The D. F. Morgan Boiler Company, 23–25 West Lake street, Chicago, are overhauling the steam heating plant in the building to be occupied by the Iroquois Club, Michigan avenue and Adams street.

The Taylor School, Augusta street, near Noble, is to be supplied with a direct and indirect steam heating plant and fan system of ventilation by the Kelly & Jones Company, 48–52 North Clinton street, Chicago.

T. C. Boyd, 42 Dearborn street, Chicago, is completing the plumbing, gas fitting and sewerage work in the residence of Geo. L. Petersen, 599 Pine Grove avenue.

Peck Bros. & Co., 259 Wabash avenue, Chicago, have just furnished their Boyd lavatories, triple jet closets and porcelain baths for J. B. Scott's residence, 410 Ashland avenue. The firm report a steady increase in the use of their corrugated soil pipe for first-class work.

E. Baggot, 169–171 Adams street, Chicago, is to furnish the plumbing, gas fitting and sewerage for the flat building of F. J. Urson, 3554 Cottage Grove avenue.

The Kewanee Boiler Company, 96 Lake street, Chicago, have furnished one No. 12½ Haxtun boiler to be used in the Menoken Club House. The Samuel I. Pope Company, 360–364 Dearborn street, do the steam fitting.

The J. L. Mott Iron Works, 311–313 Wabash avenue, Chicago, are to supply a large Sunray heater and necessary radiation for heating the new hotel at Evanston, Ill.

August Deschler, Chillicothe, Ohio, has secured the contract for heating by steam the First Presbyterian Church. A Florida heavy duty heater, manufactured by the American Boiler Company, is to be used.

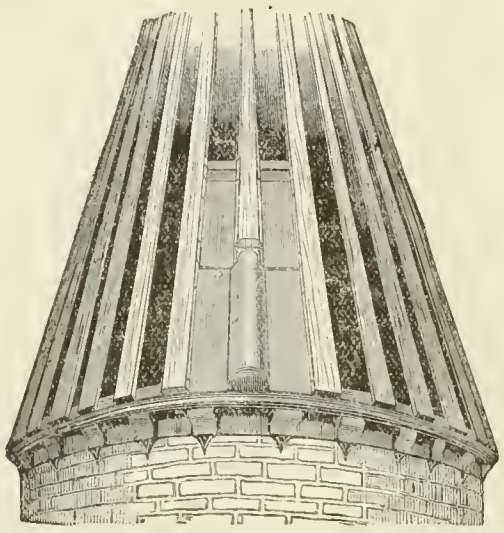
The contract for heating the new Masonic Temple, Richmond, Ind., has been let to McGinnis, Smith & Co., Pittsburgh, Pa., their bid for the work being $2700.

Sealed proposals will be received at the office of the Superintendent of Public Buildings, Lowell, Mass., until March 9, for the heating and ventilating of the four-room addition to the Butler School building.

ROOFING AND CORNICE.

Merchant's Graduated Tiles.

We show in the accompanying illustrations views of a graduated metal tile of Spanish pattern that is being put on the market by Merchant & Co., Incorporated, Philadelphia. The graduated tile are so made that parts for any tower of whatever inclination or pitch may be selected from a few stock patterns. Each tile consists of two parts, known as the round section and the flat section. In laying, the circumference of a conical roof is divided into the same number of spaces as it is desired to have courses of tile. Tapering strips of wood are then nailed on the sheeting boards from eaves to apex, as shown in Fig. 1. These strips taper in width and also vary in thickness, and are arranged to fit inside the curved portion of the tile shown in Fig. 4. The curved tile are made with appropriate taper in each section and with ears at the upper end for bending down and nailing to the wooden strips. There are also interlocking flanges which connect one section with another in a telescopic joint. The flat tile are first put in place between the wooden strips, as shown in Fig. 1, and nailed through the flanges to the tapering strips. The flat tile are sent out with only one edge bent, as in Fig. 2, the other being bent as required (see Fig. 3) by the person laying the tile, the bending being done with ordinary tongs. After the flat part is in position the round part is put in place, the successive courses being applied and interlocked. Messrs. Merchant & Co. are making at present 32 sizes of this tile, and will supply on short notice the covering for any tower of which correct dimensions are supplied them. They send with each order a specification of the wood strips, giving width of bottom, length and thickness of bottom and thickness of top, together with spaces between strips at the bottom, and indicate the amount of given numbers of tile that will be required for the several courses, the tiles having their numbers stamped on them.



Merchant's Graduated Tile.—Fig. 1.—Tower with Wood Strips for Laying Graduated Tiles.

Fig. 2.—Graduated Flat Tile with One Edge Turned.

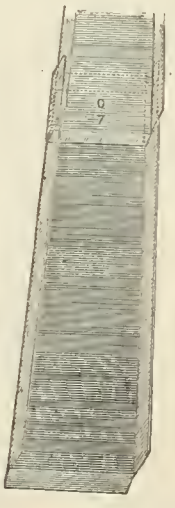


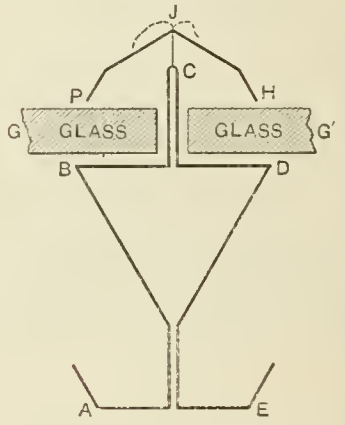
Fig. 3.—Graduated Flat Tile with Both Edges Turned.

Fig. 4.—Graduated Round Tile.

Water Tight Connection for Skylight Glass.

From G. M., *Camden, N. J.*—I am about to construct a sheet metal skylight, and would like a little information on making a water tight connection between the edges of the glass and the metal.

Answer.—The connections between the glass and metal in skylight work are made by means of putty, rubber or sheet lead. The latter method was shown in *The Metal Worker* of December 2. The manner of securing the glass to one of the side bars of a skylight, putty being used for the purpose, is shown in Fig. 1. In this figure, A B C D E represents the bar, P H the covering cap and G G' the glass. The covering cap is secured to the bar by means of a doubled strip of copper, C J, which is fastened to the bar, passes through a slot cut in the cap, and is



Water Tight Connection for Skylight Glass.—Fig. 1.—Method of Securing Glass to Side Bar.

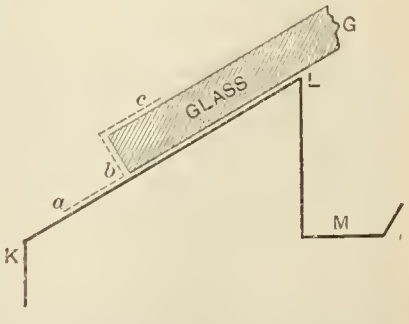


Fig. 2.—Securing Glass at Curb.

bent over in opposite directions, as shown at J, thus holding the cap in position. The putty is placed between the glass and bar, as shown at B D, and makes a water tight joint at this part of the structure.

The curb of skylight can be made in any convenient shape, or as shown by K L M in Fig. 2. The trough M receives the drip from glass and side bars,

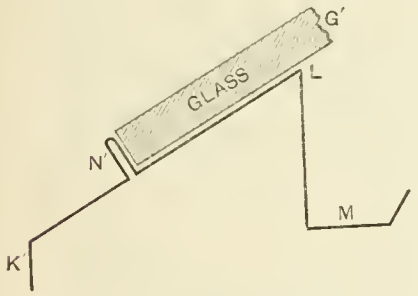


Fig. 3.—Second Method of Securing Glass at Curb.

and can be extended through the sides of skylight, thus allowing the condensed moisture to escape. To prevent the glass from slipping down, strips of copper can be fastened to the curb and bent over the glass, as shown at *a b c*. Putty is also to be placed between the glass and curb. Another method of holding the glass in position at curb is shown in Fig. 3. The curb is formed as indicated at N', thus securing the desired result. The manner of joining the glass to ridge bar is shown in Fig. 4. Putty is placed between ridge and

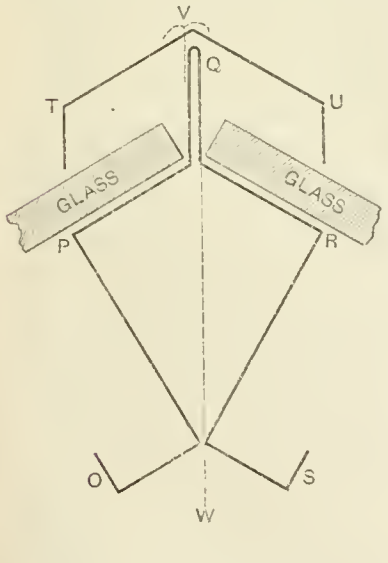


Fig. 4.—Securing Glass at Ridge.

glass, as indicated at P R, and the cap placed over and secured by the doubled copper strip Q V, which passes through a slot in cap and is bent over as shown at V, thus securing the cap in position. If the skylight was to be made with a single pitch only half of the ridge bar would be required, and could be formed as indicated by O P Q W, Q W forming the upper part of the skylight.

FLASHINGS.

The Expanded Metal Fire Proof Construction Company of New York City, with a capital of $50,000, were recently incorporated. The directors are John F. Golding of Chicago, John H. Parker, Joseph H. Combs, Martin S. Mosher and Wm. P. Testevin of New York City.

Disley & Weinand, Waterbury, Conn , have done the sheet metal, cornice and skylight work on a number of buildings recently, among which are the State Normal School at Willimantic, Christ Church at Ansonia, Library Building at Naugatuck and the Telephone Building at Waterbury.

Notice is issued to the trade under date of February 14, by Schmidt & Weitzel, 106 Builders' Exchange, Cincinnati, Ohio, that they now represent in that section the Cincinnati Corrugating Company of Piqua, Ohio. They recommend the use of sheet steel, well painted, as a durable and cheap roof covering, and they will be pleased to furnish estimates on corrugated roofing, siding, ceiling and arches, corrugated lath, shutters and doors, V-crimped and standing seam steel roofing, steel brick facing, weather boarding and beaded metallic ceilings. They make a specialty of sheet metal work of all descriptions and are prepared to estimate on cornice and door caps, hot and cold air pipes, ventilators, &c.

F. J. Geissinger, 1525 Clearfield street, Philadelphia, Pa., distributes an attractive circular addressed to his customers and the public. Mr. Geissinger announces that having purchased a piece of ground 60 x 200 feet he will erect one of the largest and best steam power cornice works in Philadelphia, which he will equip with the latest improved machinery for forming all kinds of sheet metal. His specialties are skylights, sheet iron fronts, awnings, fire door linings, ceilings, bay windows, oriels, &c.

Another enjoyable evening was spent by the students at the New York Trade School last Tuesday, listening to addresses from the following speakers: Robert Rutter, ex-president of the General Society of Mechanics and Tradesmen and a practical bookbinder, clearly described the process of book making, from the time the copy was received until it became a book. John Ward Stimson, principal of the New York Institute of Artist Artisans, urged the young men to call education to their assistance in their trades, in order to rise above being a mere machine. President R. Fulton Cutting spoke of trades unions and their power for good if properly used and their capacity for evil when used for selfish aims.

Steps are being taken for the establishment of a municipal electric light plant in Philadelphia, to be owned and operated by the city on similar lines to the city's gas works.

Germany is beginning to feel the effects of the immigration of pauper aliens into that country. The German Goverment has just issued some strict regulations governing the passage of Russian and other emigrants through the Fatherland on their way to the United States in order to prevent them from settling in Germany.

Water Supply of Albany.

Albany (N. Y.) journals are loud in their complaints of the miserable water supply of that city. The main supply is derived from the Hudson River, and is, it appears, pumped from the intake at the foot of Quackenbush street by a single set of pumps, which are in almost constant use and which have been performing steady service for a number of years. Should this machinery fail, from any cause, coincidently with the outbreak of a fire in the city the possibilities would be dreadful to contemplate. Even under the present "regular" service the odds in favor of the fire appear to be large, judging from the following extract from the account of a recent conflagration in Albany, given by the Albany *Express:* "After a line of hose had been laid and connections had been made, there issued from the nozzle a puny stream about $\frac{1}{3}$ inch in diameter, rising to a hight of about 10 feet. The crowd jeered and hooted while the firemen turned this stream in the direction of the fire, which was merrily blazing 30 or 40 feet above." As an explanation of this failure, the Fire Commissioners are said to claim that the mains conveying the water from the pumping station to the reservoirs are so weakened by rust that almost numberless breaks have occurred, and that to put up extra pumps creating a greater force would cause the pipes to burst. Meanwhile it is understood that new pumping machinery, for which the city has paid $160,000, is lying idle and deteriorating under exposure to the elements.

Shrinkage Rules.

Keuffel & Esser, 127 Fulton street, New York, and 265 State street, Chicago, are manufacturing a boxwood shrinkage rule or scale with brass ends, for the use of pattern makers. It is not offered as a new implement, but as one better made and more accurately graduated than many heretofore made. The purpose of this kind of rule is to enable the workman to so construct a wooden pattern that when the metal pattern is cast from it, when cooled and shrunk will be just the size he originally intended it should be. Having in mind the regular scale of shrinkages of the various metals, the pattern maker, for example, uses a rule ostensibly 2 feet long, but actually 24¼ inches in length. This is subdivided in eighths, tenths, twelfths and sixteenths, so proportioned that the pattern made to this standard will produce a certain metal pattern which, after shrinking, will be the required size. The rules are made in the following lenghts —viz, $24\frac{2}{10}$, 24¼, 24⅜, 25, 25½, 26, 26¾ to 2 feet, and graduated in eighths, tenths, twelfths and sixteenths by machinery. These rules are likewise valuable where double shrinkage must be considered.

Plans have been accepted and work will, it is stated, be immediately begun on the new building for the American Surety Company, at Broadway and Pine street, New York City. It will be another mammoth erection, and will overtop the Manhattan Life's new structure near by, on Broadway, which is one of the tallest houses in existence. The tendency to the erection of "sky scrapers" has become very marked in New York of late years.

TIN PLATES.

The New Castle Steel & Tin Plate Company,

New Castle, Pa., are in operation to their full capacity and shipping their product about as fast as made. At the present time the output of this concern amounts to about 30 tons of black sheets per day, about one-half of this amount being tinned, the balance being sold in the open market. Extensive additions to the plant are now under way, and when these have been completed the capacity for production will have been increased about one-third. This firm make their product from the ore up to the finished material. Their Bessemer billets are obtained from the Shenango Valley Steel Company, an identified interest, whose plant is located only a few hundred feet away, and this insures uniformity of product at all times. The main building of the New Castle Steel & Tin Plate Company is surrounded by an elevated railroad track, and on this is received all the raw material used. In one corner of the building is located a large heating furnace, fired by gas producers. In this furnace the billets are reheated and then taken to the rolls by means of a "telegraph," and after being reduced to the proper dimensions are then taken to what is known as a "bosh." This is a large tank sunk in the floor and filled with water, into which the sheet bars are plunged and cooled, after which they are taken to the shears, situated at the end of the "bosh," when they are sheared to the proper length. This mode of handling the billet until it is put into sheet bars requires only one minute or less, and will permit of the handling of a large amount of steel at a minimum cost. Excellent reports of the quality of the black sheets and also the tin and terne plate made by this concern have been received from customers in different parts of the country, which show that the New Castle Steel & Tin Plate Company have already established an enviable record for their product, second to none in the country.

Assignment of James B. Scott & Co.

Following closely upon the death of James B. Scott of the firm of James B. Scott & Co., tin plate manufacturers at Pittsburgh, came the announcement that the affairs of that firm had been placed in the hands of an assignee. James Collord, a well known iron broker of Pittsburgh, being appointed to that position. The announcement that an assignee had been appointed to take charge of the business of James B. Scott & Co. created considerable surprise in business circles in Pittsburgh, as the firm was generally regarded as a prosperous one, doing a very large business and making money. In explanation of the reasons for taking this step it is stated that the assignment was made pending the settlement of the personal estate of the late James B. Scott. It is further said that the firm is not in the least embarrassed in a financial way, and that despite the depression in trade circles, with its consequent reduction of valuations, it is able to pay all obligations dollar for dollar. It is further said that the past year has been a successful one for the concern, it having made money. The reason for the assignment, it is said, is to protect the firm's creditors and the firm itself from any embarrassments or complications which might arise from claims of the late James B. Scott's personal creditors. Mr. Scott was generally accounted a wealthy man. With the assignment of the firm comes the intimation that the estate of the deceased would now be in a far better condition than it is had he paid more attention to business and less to philanthropy; that if, instead of working in and out of season for the State and for the good of humanity, he had devoted himself more to trade conditions, the making of an assignment by the firm would not have been necessary. It is intimated further that Mr. Scott was made a victim of his own kindness of heart, and reference is made to a recent instance of this, where his indorsement of the paper of a friend who died cost him between $30,000 and $40,000. It is also hinted that there are other like cases. Messrs. A. G. and W. U. Follansbee, surviving partners of James B. Scott & Co., and who have had entire charge of the business affairs of the firm for some years, and through whose efforts the business was brought up to its present proportions and made so profitable, will give their entire attention to the business as formerly, for the benefit of the assignee. It is expected that within a very short time definite information as to the outcome of the affairs of the firm will be ready for the creditors.

SCRAP.

Duquesne Tin Plate Works, Pittsburgh, Pa., have been operating their plant steadily since its inauguration. The capacity of the works is from 150 to 200 boxes daily, and they state that they have enough orders for roofing plates on their books to keep them busy for the next three months.

The sheet mills of the Falcon Iron & Nail Company, Niles, Ohio, are reported as running to full capacity to fill orders, of which enough are now booked to keep the plant busy for some considerable time to come. There is said to be a large and increasing demand for the black plates of light gauge made by this concern for tinning purposes. At the office of the firm's New York agent, George H. Ismon, 277 Broadway, are to be seen some handsome samples of their product, which show that they need not fear comparison with any imported black plates in respect of toughness, ductility, smoothness of surface and general excellence of finish.

Persistent efforts are being made to encourage the cultivation of ramie in the United States, with a view to its use as a textile and for paper making material.

An Exhibit of Canning Machinery.

The very important part now taken by machinery in canning vegetables and fruits was shown last week in Chicago. The occasion was the annual convention of the Canned Goods Association. It was an excellent opportunity to show canners from all parts of the continent the latest devices invented for their benefit, and the manufacturers took advantage of it. They secured a fine large room, with power, on the third floor of the building at 241 to 247 South Jefferson street, allotted the space among themselves and installed their machinery in exposition style, so as to show it in practical operation. The display thus made was extensive and exceedingly interesting, comprising machinery for all purposes in connection with the canning business, beginning with presses for punching can tops and bottoms from tin plate, following that up with coating devices, filling apparatus, machines for soldering tops on cans, machines for gumming labels, &c.

G. A. Crosby & Co. of Chicago occupied a prominent space, exhibiting their No. 45 power press, intended for heavy work, having a bed opening of 8 x 14 inches; their No. 30 press, with a bed opening of 5 x 8 inches, and their No. 16 press, with a bed opening of 3 x 5 inches. A small press was shown which is so constructed that it can be mounted either on legs or on a bench, and either in an upright or an inclined position, and adapted to a great variety of work in sheet metal. They also exhibited a new automatic double headed crimper, which is designed to crimp, at the same time, both ends on to the bodies of round cans. They further showed a new power solder cutter for cutting drop solder. In this machine the bars to be cut are laid on the bed plate and weights hold them tight against a stop piece in front, which is adjustable. As soon as the cut is made the weights feed the bars forward for another cut. All these machines were placed in line and belted from one shaft, making a neat and creditable display.

The Andrews & Johnson Company of Chicago showed the Johnson high speed engine attached to disk fans and blowers.

The Baker Mfg. Company of Muscatine, Iowa, exhibited a fine collection of special machinery suited to the requirements of those who can vegetables and fruits on a large scale. Much of this machinery is massive. The steam process, boxes and horizontal and upright process kettles are as substantial as the ordinary steam boilers. In this display there were steam can cleaners, pea can filling machines, air pumps, enormous tomato cookers, can soldering machines, &c. The machines for soldering can tops are ingeniously constructed, the soldering tool being attached to a swinging arm capable of covering considerable space. The tool is kept heated by gas passing through its interior. The labor saving idea runs through all the machinery made by this company, whose works were founded in 1882 and are now claimed to be the largest in their line in the world, employing upward of 600 men.

Daniel G. Trench & Co. of Chicago, as Western agents for a number of manufacturers, made an excellent display. They showed the Stevens can filler, by Maurice B. Ayars of Salem, N. Y.; the Canadian capping machine corn cutter and corn silker, by Sprague Mfg. Company of Farnham, N. Y.; apple parers and corers, by the Goodell Company of Antrim, N. H.; also the Hawkins capping machine, just brought out.

George H. Colket & Co. of Philadelphia showed their improved Climax capping machine. The Hemingway Mfg. Company of Syracuse, N. Y., exhibited cookers and syruping machines. Frank Diesel of Chicago, can manufacturer, showed a variety of samples of tin cans. Henry B. Keeley of Vinton, Iowa, exhibited the Keeley corn silker. Cox, Bro. & Co. of Bridgeton, N. J., showed a tomato scalder and a capping machine. H. C. Baxter & Co. of Brunswick, Maine, exhibited a corn cooker and filler, corn silker, mixer, wiper, and an air compressor.

The Burt Mfg. Company of Rochester, N. Y., exhibited the Burt kerosene oil system of soldering, which is especially adapted to the use of large factories in which numbers of tinners are employed and a large number of soldering tools must be kept in constant use. They also showed the Burt tray wiper and the Burt topping machine. Included in their display were steel floor trucks and basket trucks manufactured by L. Murray Moore of Rochester.

The Sinclair-Scott Mfg. Company of Baltimore showed pea hullers of large capacity, scalders, can fillers and a variety of other special machines of their own design. They also exhibited the Perfection steam crane and demonstrated its advantages in large canning establishments.

Norton Brothers of Chicago showed their latest capping machine. This is constructed with a workman's bench at each end. The cans pass round the machine on an endless carrier. Both sides of the machine are fitted with automatic solderers, wipers, &c. Each workman takes off two complete cans as they pass in front of him and puts two in their place, and thus each keeps the other supplied with work. The capacity of this machine is 2300 cans per hour.

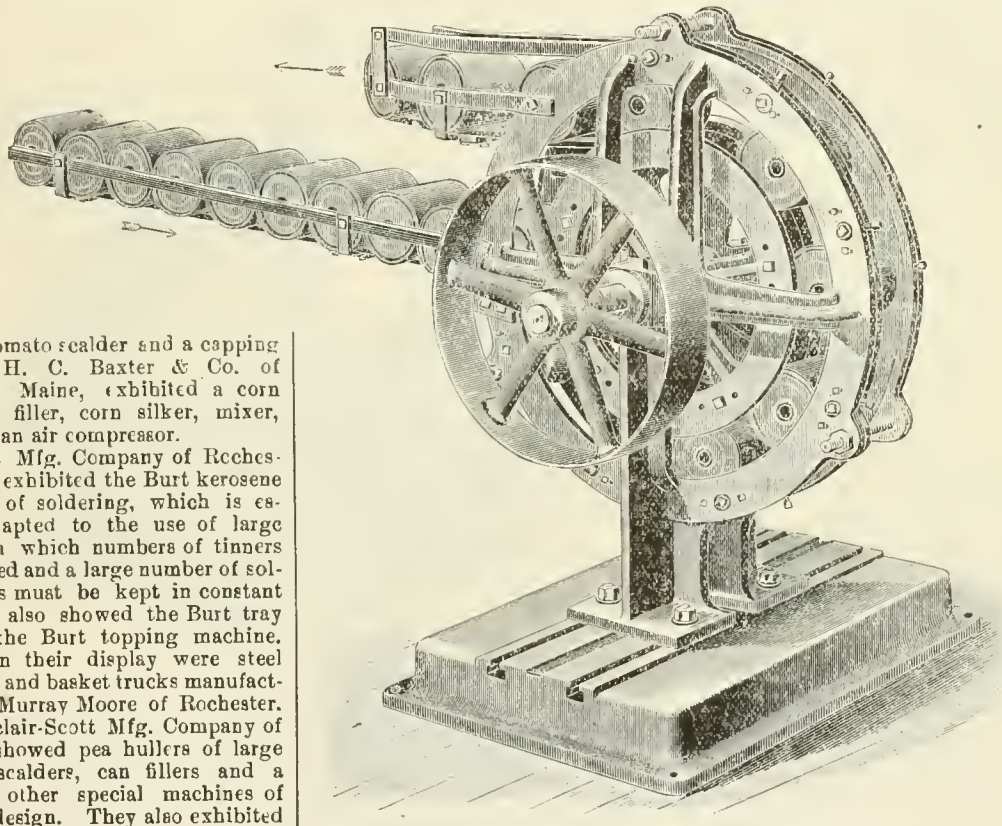
Merrell & Soule of Syracuse, N. Y., exhibited an automatic corn canner, filling considerable floor space, which cooks corn and fills and caps cans in one continuous operation. The Barker Mfg. Company of Portland, Maine, exhibited a power corn cutter, a hand corn cutter and a silker. The Canners' Supply Company of Bridgeton, N. J., showed a power steam scalder. The Bucklin Can Filler Company of Baltimore showed a new can filler. The Xenia Canning Company of Xenia, Ohio, exhibited one of their automatic can fillers, which measures the contents of every can, while it receives, fills and discharges them without any handling whatever. R. O. Conant of Portland, Maine, exhibited a corn cooker. The Hohmann & Maurer Mfg. Company of Brooklyn showed a large line of samples of special thermometers and gauges for use in connection with canning machinery. The Link Belt Machinery Company of Chicago had a representative on the ground with a large number of photographs of factory interiors, showing the company's shafting, pulleys, elevators and conveyors, power transmission, &c.

Not the least interesting feature of the display was the department devoted to labeling machines, for pasting labels on the filled cans. These were shown by the Wight Labeling Machine Company of Boston, the Milwaukee Labeling Machine Company of Milwaukee, and Cornell & Knapp of Adrian, Mich. While the apparatus employed differed in details, the end aimed at by each was to make the machine do as much as possible in handling the cans, applying the paste and attaching the labels.

Among the specialties shown which required no machinery were the following: The Raymond Lead Company of Chicago exhibited solder in all its various forms adapted to canners' use—triangular, wire, segments, drop and bar. E. W. Blatchford & Co. of Chicago also exhibited solder, making a tasteful display of the samples shown. Geo. H. King of Lynn, Mass., exhibited his new Scientific can opener, comprising in the one instrument four can openers for various shapes of cans. The National Key Opening Can Company, Masonic Temple, Chicago, exhibited their latest can opening device for opening cans by rolling the binding strip of metal round a key, thus detaching it from the can and avoiding the use of a can opener. The Morgan Box Machine Company of Rochester, N. Y., exhibited samples of their boxes made with dovetailed corners, claimed to be much stronger and cheaper than nailed boxes.

Patent Automatic Double Headed Crimper.

We present in the accompanying cut an illustration of the new patent automatic double headed crimper manufactured by George A. Crosby & Co. of Chicago, Ill., and which is designed to crimp at the same time both ends on to the bodies of round cans. The crimping is entirely automatic, the cans being fed into the machine and crimped and discharged without handling, the machine having a capacity of 150,000 cans per day of ten hours. The cans with the heads snapped on loosely roll from the feeding trough or chute into the machine and are carried around between two sets of wheels, which set the heads down on the bodies as required and crimp them so that the burrs will either stand out straight against the body of the can or with the burrs curved inwardly or outwardly, as may be desired. After this operation the cans roll out through the discharging trough ready for fluxing. A particular feature of this crimper, and to which the makers invite special attention, is that it does not require the ends to fit the bodies tightly before they enter the machine. The ends may be large enough or the bodies small enough so that they can be snapped on easily and loosely, thus facilitating the operation of handling. The crimper is so constructed as to admit of adjustment for different widths of burrs or different lengths of bodies, but is not adjustable for different sizes of cans. If desired, however, a suitable machine can be built for two different diameters of cans for placing on the same stand. The machine is so arranged that there is comparatively no friction caused by the cans rolling between the wheels, thus, it is said, making it almost indestructible.



Patent Automatic Double Headed Crimper.

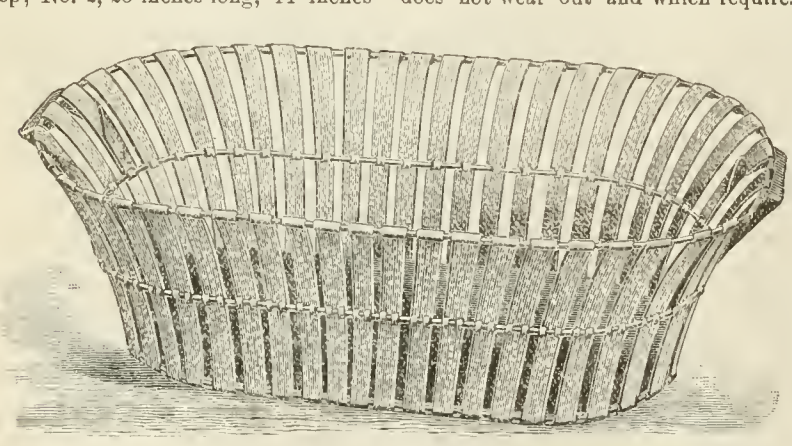
THE RETAIL STORE.

A Half Century in Business.

William P. Fuller, who keeps a stove and tinware store on St. Peter street, Salem, Mass., has completed 50 years in business, having commenced his career on February 1, 1844. Mr. Fuller was born in October, 1819, in Salem, and at 14 years of age went to work for his father, who was a tin worker and kept a shop on Neptune, now called Walnut street, in Salem. He served an apprenticeship of seven years, and some time after he attained his majority went to Boston and worked at his trade. Later he returned to Salem and began business for himself, taking for a partner Thomas Reed, the partnership, however, continuing for only a year. Mr. Fuller remained on Washington street for a period of 22 years, and then removed to the building on St. Peter street, three doors from his present quarters. He then took for a partner Charles W. Dodge, the relation continuing a year until Mr. Dodge went west. It is said that of all the firms on Essex street in 1844, not a single one is engaged in business to-day.

Century Steel Basket.

The accompanying cut represents a steel basket being introduced by the Buffalo Specialty Mfg. Company, Buffalo, N. Y. The basket is all steel, excepting the bottom, which is hard wood. The metal part is galvanized, making it attractive and rust proof. The manufacturers claim that the basket remains sweet and clean, as nothing can penetrate into it, that it cannot wear out and that it cannot break. It is designed as a handsome, strong, attractive and light display and delivery basket for grocers, butchers, bakers and merchants generally. The baskets are made in three sizes: No. 1, 21 inches long, 13 inches wide and 7¾ inches deep; No. 2, 23 inches long, 14 inches wide, 7¾ inches deep, and No. 3, 25 inches long, 15 inches wide, 7¾ inches deep. The dimensions given are top measurements.

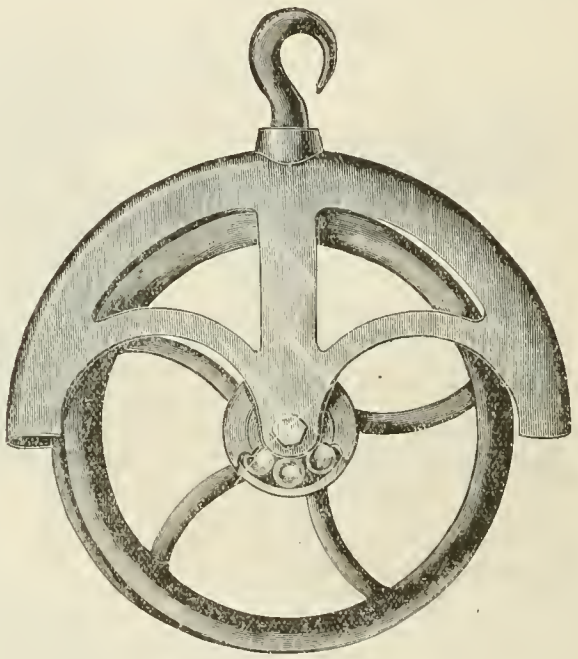


Century Steel Basket.

Geo. W. Rockwell, dealer in Hardware, Stoves, &c., Horseheads, N. Y., has admitted as partner in his business Chandler A. Hammond, a former clerk in his employ. The new firm will be known as Rockwell & Hammond.

Ball Bearing Well Wheel.

The cut shown herewith represents a ball bearing anti-friction hoisting or well wheel pulley, offered by T. F. Cheriton Hardware Company, 62 Reade street, New York. The manufacturers claim that the ball bearing principle thus applied to well wheels results in a perfect anti-friction pulley which runs easily, does not get out of order, does not wear out and which requires less labor in use. The wheels are made in 10 and 12 inch sizes, japanned.



Ball Bearing Well Wheel.

C. Pratt has taken a portion of F. J. Mattison's office, at 69 Beekman street, New York, and is offering, as agent for this territory, a line of fine Cooking Utensils at very low prices. These goods are manufactured by Hall & Carpenter, Philadelphia, Pa., and are known as Crown Scorch Proof Cooking Utensils. The manufacturers guarantee them made of XXXX best charcoal tin, with 20-ounce copper bottoms. They are double bottomed, the copper extending up the sides from 1 to 1½ inches. The space between the bottoms is filled, they state, with the finest quality of asbestos, making the vessels proof against scorching or burning. This line of goods, patented in the United States and in Canada, consists of Saucepans and Kettles, each four sizes, 2 to 6 quarts; Sauce Pots, 8, 10 and 12 quarts; shallow Stew Pans, four sizes, all with heavy retinned covers, and Chocolate Pots, 2, 3, 4, 5, 6 pints. The outer surface is buffed to improve its appearance. The Crown Asbestos Stove Mat, circular in form and 9 inches in diameter, is offered in connection with the other goods.

Lape's Scissors Sharpener.

In Fig. 1 is shown a full sized cut of a scissors sharpener introduced by W. E. Lape, Syracuse, N. Y. It is made of emery, and, it is remarked, will never wear out. The wire is designed as a

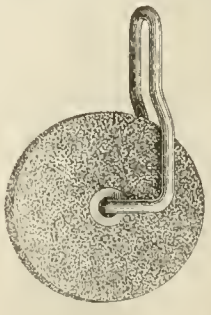


Fig. 1.—Lape's Scissors Sharpener.

gauge to retain the beveled edge on the scissors when in use, as in Fig. 2. The flat side of the blade is placed against

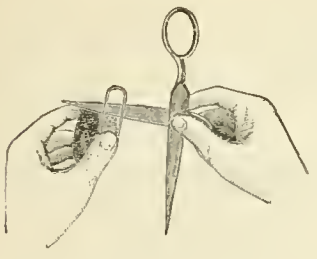
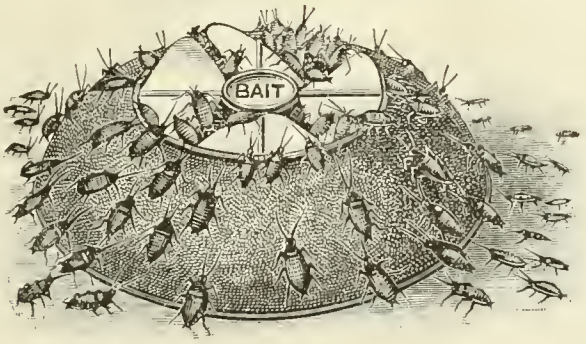


Fig. 2.—Scissors Sharpener in Use.

the wire and the blade moved back and forth under firm pressure, both on the wire and wheel.

Yankee Roach and Beetle Trap.

The accompanying cut represents a roach and beetle trap, offered by Silver & Co., 304-310 Hewes street, Brooklyn, and 20 Warren street, New York. The trap is made of tin, with a granulated surface, 8 inches in diameter and 3 inches high. At the top of the trap



Yankee Roach and Beetle Trap.

are sensitive revolving plates which turn with the weight of the bug when trying to reach the bait at the center. The trap is entirely of metal, and it is stated that it is always ready for use and easily emptied.

Improved Boxwood Folding Rule.

Keuffel & Esser Company, 127 Fulton street, New York, are manufacturing an improved boxwood folding pocket rule, so arranged at the joints that when opened the sections are aligned throughout instead of zig-zagging, as has been the difficulty heretofore. This, of course, shortened the measurement and impaired the correctness of it, unless extreme care was used to keep the line straight. This is effected by mounting the inner sides at the joints with strips of thin spring sheet steel, in which are punched straight ridges which articulate with corresponding indentations on the opposite piece when the rule is either open or closed. Especial attention is called by the makers to the fact that they are thinner and lighter than the ordinary joint rule and extremely accurate from the reason that the wood is peculiarly prepared to prevent shrinkage entirely. The rules are made in 16 sizes, from 2 two 8 feet long, having from 4 to 16 folds. Four of the sizes are made extra flexible for measuring curved or bent objects if desired.

MEMORANDA.

THE STOVE AND TINWARE STORE of Winston & Higgenson, Waco, Texas, was destroyed by fire on February 14.

IN *The Metal Worker* of February 17, in referring to the partnership of Samuel M. Wilkinson and Miles J. Watson, under the name of Wilkinson & Watson, we erroneously stated where they would open a new hardware store. The firm are in business in Oberlin, Ohio, not Mansfield.

IN A CIRCULAR to the trade Cordley & Hayes, 172 Duane street, New York, call attention to new lines of Indurated Fiber Ware, which are included in their catalogue under date of February 15, 1894. These goods include Ice Water Buckets, with faucets; Chambers, more especially adapted for use in public institutions, and Fire Pails with flat and round bottoms. Reference is made to the fact that goods will be shipped promptly upon receipt of orders, and that their trade-mark and label appear on each article.

A scheme for assisting the deserving poor and those out of employment has been started by a well-known clergyman in New York City. It is a pawn shop and loan office where they can obtain immediate financial help at the lowest possible cost. The enterprise has proved highly successful, and it is said to be backed by one of the wealthiest citizens of New York. Such has been the run on the pawnbrokers during the past six months that many are now discriminating closely in the loaning of money.

A movement is on foot toward the consolidation of the pipe line interests of the United States which are outside the Standard Oil Company.

Disagreement in regard to the wage scale caused the closing of all the coal mines in the Massillon district, Ohio, on Saturday. Three thousand miners were thrown out of work.

A pamphlet recently published by *Bradstreet's* gives an interesting analysis of the causes of the 15,508 failures in business which occurred during last year. They are given as follows: Incompetence, 2546; inexperience, 940; lack of capital, 5194; unwise credits, 726; failures of others, 446; extravagance, 198; neglect, 481; competition, 191; disaster, 3463; speculation, 181, and fraud, 1142.

Secretary Herbert has refused to entertain a petition forwarded by the Central Labor Union for the opening of the Boston Navy Yard, on account of the heavy expense that would be entailed on the Navy Department in putting the yard into a proper condition for work.

Methods of Advertising.

BY D. C. FOOTE.

After many years of experience in the Hardware business and its various branches, one may begin to realize some of the qualities and methods required to build up and extend a business that shall be both substantial and remunerative. To be thoroughly successful one must have a liking or adaptation to the business, for while to the uninitiated it may look easy, not every one can conduct a Hardware store and make it pay; at least not without some previous training for their chosen vocation.

While one must be governed in methods by his location and trade, yet there are a number of general principles that may influence the extension of one's business by increasing the demand for the merchandise which is offered for sale. Advertising in the local papers, if judiciously done, may be considered one of the most important means to this end. The writer believes that ordinarily a brief statement of the facts concerning the goods to which one wishes to call attention is better and has a more lasting effect than an elaborate or overdrawn statement or one of too many words.

CUT IN PRICES.

A cut of the article or articles advertised is a great factor, especially in this line of business. The advertisement should be changed as often as once each week each succeeding advertisement being more attractive and novel than the former, if possible, for when an advertisement becomes stale it is a waste of printers' ink. One of the best advertisements of Hardware that I have ever seen was used by an energetic firm who do an exteusive and growing business in Southern Michigan. This consisted of a cut of some leading event of the day, with a few words relative to it leading to some special article for sale. This was changed nearly every week with a new cut, and when displayed near the column of local news was always observed and while occupying a small space always hit the mark. The cuts were obtained of a firm who make this work a specialty—suiting the cut to the advertisement desired.

NEWSPAPER ADVERTISING

is an art which evidently had never been cultivated by the firm who had furniture to sell and also combined undertaking with their business, and who, wishing to call attention to their bargains in furniture, headed their advertisement in bold type: This will interest you; and following this announcement with the cut of a hearse. A student in Yale College is fitting himself especially for writing newspaper ads, finding in it a field both congenial and remunerative, and when cultivated talent is used for this purpose one may expect to reap results accordingly: Hood, Wanamaker, and a host of others attest by their success the power of the pen to extend business. One Hardware jobbing house is pinning its faith to this method by investing $50,000 in advertising a special make of Bicycle, which will doubtless make it one of the leading wheels. This enterprise in advertising may be used by retail dealers on a reduced scale to advantage.

Advertise, advertise.
Art in asking him who buys
There the merchant's secret lies.
Advertise.

Circulars, while often cast aside as of minor importance, yet serve in their humble capacity to arrest if not hold the attention of a customer, and often form the connecting link in the chain which binds a bargain. But how most

efficiently to use them is the question. To distribute them from door to door is antiquated and unsatisfactory, and in many of the larger cities is justly prohibited. The best way to dispose of circulars and other printed matter is to have a box of suitable size in which to arrange and classify them, placed conveniently near the wrapping counter, and when goods are done up, neatly insert in the package such circulars as would be of interest to the customer. This is the most delicate and effective way of using them and often proves a good investment for the trouble. There are other ways of using them, but the writer has found this the best solution of their disposal.

CUNNINGLY DEVISED.

One of the most unique and striking advertisements was recently used by an enterprising Hardware firm in one of our leading cities, as follows: There appeared in the daily paper an advertisement that this firm would give away 500 gas stoves, and those desiring to secure one should call and see a sample of the stove and leave their names and the stove would be delivered on a certain day. It was a one-burner stove which usually retails for $1.50 and was really a desirable article. No such generosity had ever been heard of before in a business way and, as may be imagined, the people came with a rush and kept the clerks busy taking their names till the desired number was reached. Of course, to give away 500 stoves without any benefit to the donor could hardly be expected. The rubber tubing used for connecting the stove, which was required to be purchased of the firm, partially paid the investment, while the demand created for the ovens, broilers and other furniture to complete the outfit reduced the loss to a minimum if it did not in the end leave a profit by creating a future demand.

A CHEAP CATALOGUE.

A photographic reprint of a large Hardware catalogue reduced in size to 5 x 6 inches and about 2 inches thick, containing over 1200 pages, bound in red cloth, was recently made by a large jobbing house, leaving out their name entire and inserting the name of the retail dealer, to whom it was sold at a cost of 30 cents per volume. This distribution to the customers of the retail dealer was highly appreciated and is one of the most permanent mediums of advertising that has ever been originated. Where one has seasonable novelties in the house furnishing line to sell, a large special postal card, containing cuts and descriptions of articles, mailed to prospective customers, often brings purchasers.

STOVES.

One of the the most important articles in a general retail Hardware store is stoves, an article in which there is usually severe competition, and their successful sale depends much upon the method used in showing them. The writer believes the model way to show them is to have a room separate if possible from the general store, and this attractively furnished, walls papered, floor carpeted, and supplied with chairs for the comfort of customers. The stoves exhibited, thoroughly blacked and polished, should be arranged on large caster trucks so as to easily handle them before a purchaser. When a cooking stove of unusual merit is being offered an exhibition of its baking qualities might be given, and an announcement of such an exhibition made in the local paper, stating the day and hour and inviting those especially interested to come and witness its merits as a baker. This same idea might be followed up with many other lines of goods, mantels and grates, Builders' Hardware and many things in the house furnishing line where the size of the town or city will permit of it, and even in small towns one would find this method profitable.

DISPLAYING GOODS.

There is nothing that will do more to keep pace with the times than the proper displaying of goods. The front windows are a most important part of this feature, and cannot be overestimated. A man may be clothed in the most fastidious manner and in the latest fashion, but if his face be grimy and unshaven it will mar the whole and no one will remember anything but the face. So it is with the store. The office and the goods on the shelves may be in good order, but if the show windows are dirty and used for storage rather than display the effect is depressing on the observer; while on the other hand, a window that has a clean front, with goods attractively displayed, will often cause a passer by to stop and look, with many chances of his becoming a purchaser. It is not in the province of this discussion to make suggestions as to how most attractively to dress a window with Hardware, but when dry goods and other stores find it profitable to pay good salaries for special work of this kind, it should not fail to interest those who are desirous of extending their trade.

CLERKS.

The arrangement of the store should be as automatic as possible. The wants of the customer should be responded to without any bungling by experienced clerks, who are thoroughly posted in the routine of the business of their special department. Too little attention is given to the old proverb, "Knowledge is power," for therein lies the sequel for a successful salesman, and as he is the motive power which propels the craft, it behooves the commander that his crew are well instructed and thoroughly drilled, for upon them depends his success or failure. Where more than four or five clerks are employed I believe it a most commendable plan that they be made thoroughly conversant with any new or special article purchased. This can be done by the buyer, who obtains his points from the traveler, or by the traveler himself. Suppose a new kind of lawn mower has been purchased. Call the salesmen together at a convenient hour, say immediately after closing, if no other convenient time can be found, and spend a half hour, or even less, in exhibiting the special points of the mower—dissecting its parts and comparing its points with those of other manufacturers. Encourage comments by those present as to their ideas regarding the superior or defective points. This could be made a social evening, if thought best, with light refreshments, with papers previously prepared upon any special article relative to the trade, or debates might be given on such questions as—Resolved: That cut nails are better for general use than the wire nail, or that hot water heat is superior to hot air for heating houses of moderate size, &c.

FAMILIARITY WITH GOODS.

The writer has often found points gained by overhearing a traveling man who was well posted dilate upon an article he was selling invaluable in selling the same thing to the retail customer, and if this be true in one case, why not in all? When we know a thing absolutely, with what confidence we proclaim, and hence impart our faith to the hearer! A response to the demands of one's trade as to the class and kind of merchandise required to meet its wants is necessary if one would do a healthy and growing business. To be continuously out of an article for which there is a frequent call, thus allowing custom to drift to one's competitor, is a poor way to extend business in the right direction. To study the style and class of goods best calculated to please is an opportunity not to be overlooked. It is said that John Jacob Astor once foreclosed a mortgage which he had on a stock of millinery in New York City because the interest was not paid; after matters were adjusted the business was continued with Astor as a partner. Passing through Central Park one might have noted the millionaire leisurely sitting on one of the Park seats carefully observing the bonnets of the most stylishly dressed ladies out for their promenade; any head gear of a peculiar or fascinating style was fully noted and reported to his head milliner. The consequence was that business grew, and two men have since retired from the business worth $10,000,000 apiece. I have said nothing about the power of personal solicitation, but will close by quoting from the rules of a well-known Hardware firm:

"Go for business in every direction, in the store and out of it: wherever you see a chance to make a sale work for it with all your might."

In the courts at Pittsburgh this week a bill in equity was filed by James Todd and Frank L. Slocum against C. Y. Wheeler and the Sterling Steel Company. The suit involves a considerable sum of money. The plaintiffs state that in 1889 they invented a new method of manufacturing the so called aluminum chromium steel. An agreement was made with the defendants whereby the latter were to have the right to manufacture this steel for tool steel upon paying a royalty of 1 cent per pound so long as the secret of manufacture should not be discovered and a similar steel made and sold on the market by others. The defendants paid the royalty up to April, 1893, but, it is charged, have paid none since, and a large amount is due. They have also been using the process in making projectiles for cannon for the United States Government, and from this alone there is due royalties between $20,000 and $30,000. In addition to this the defendants have organized themselves as the Wheeler-Sterling Armor Piercing Projectile Company, and are using the process in making projectiles, but have never accounted to the plaintiffs for the royalties. The court is asked to compel the defendants to give an accounting and pay the royalties due.

The Manhattan Elevated Railroad of New York City has just provided itself with an addition to its equipment of 20 new locomotives, which are the heaviest yet put on an elevated road system. They were built at the Pittsburgh Locomotive and Car Works and are designed to haul a load of five cars, weighing 29,000 pounds each, on a grade of 2.5 per cent. and at a maximum speed of 25 miles an hour. The new locomotives have driving wheels 3 feet 6 inches in diameter, cylinders 12x16 inches and a boiler carrying a working steam pressure of 140 pounds. The total weight of the engine is 47,000 pounds, of which 33,000 pounds are on the drivers. They are equipped with the Eames vacuum brakes.

Nearly 7000 potters are idle in Trenton, N. J., owing to wage disputes.

STOVE TRADE NOTES.

Cupola Management.*—V.

BY DR. EDWARD KIRK.

Lighting Up.

When the cupola is small the shavings are thrown in from the charging door and evenly distributed over the bottom. The wood is cut short and split fine and dropped down, a few pieces at a time, and so placed that the fire will burn up evenly and quickly. When the cupola is large the melter goes down into it and his helper passes him down the shavings and wood from the charging door. The shavings are evenly spread over the bottom, care being taken to get plenty around the outside to insure a good light. A layer of fine, light dry wood is then laid over the shavings, and on this a layer of heavier wood, and so on until the required quantity of wood for lighting the bed is placed in the cupola. Care is taken to arrange the wood so it will burn up evenly and quickly. A light dry wood should be used, and the pieces must not be very large or too much time will be consumed in burning them, and the bed will settle unevenly.

When the wood has been arranged the melter gets out and a thin layer of small coal or coke is placed over the wood. The bed fuel is then thrown in evenly over the wood. All the bed is put in but a few shovelfuls, which are kept to fill up any holes that may be formed by uneven settling. The charging door is then closed and the shavings lighted at the front opening. The tuyere doors are opened to give draft and the fire left to burn up. When the wood is nearly burned out and there is a good fire of hot coals at the front and tuyeres, the melter generally puts in the front and builds a wood fire on the spout to dry it. He then looks in at the charging door, and if the smoke is burned off and the fire beginning to show through the top of the bed, he puts in the remaining few shovels of fuel and makes the top of the bed as level as possible. He then closes all the tuyere doors but one and begins charging the iron into the cupola.

Straw may be used in place of shavings for lighting up when shavings cannot be procured. The wood should be dry pine or other light wood, and it must not be used in too large sticks or the bed will be burned too much before the wood is burned out; and if the iron is charged before the wood is burned out it smokes and the melter cannot see how to place the iron or fuel. For the same reason, hard or green wood should not be used in lighting up.

When the bed burns up on one side and not on the other in a small cupola, the bed may be burned upon the other side after the blast is put on and the heat run off successfully. But when the bed burns up on one side and not on the other in a large cupola the bottom had better be dropped at once. I once had to drop the bottom of a 60-inch cupola before the heat was half off, for the reason that the melter was careless in arranging the wood and lighting up, and charged the iron with the bed only burned upon one side. He thought the blast would make it burn up on the other side, but it did not, and the heat was a failure. Never burn the bed up to warm or heat up the cupola, for a cupola does not require to be heated before it is charged, and the lining burns out fast enough without wasting fuel to burn it out.

The Bed.

Iron is melted in a cupola within a limited space, known as the melting point or melting zone. The melting point is the highest point in a cupola at which iron is melted properly, and the melting zone is the space between the highest and lowest point at which iron melts properly. Iron may be melted to a limited extent above or below these two points, but it is burned, hardened and generally dull. The melting zone exteuds across the cupola above the tuyeres, and is from 6 to 8 inches in depth. Its exact location is determined by the volume of blast and the nature of the fuel employed in melting. A large volume of blast gives a high melting point, and a small volume a low melting point. A soft, combustible fuel gives a high melting point, and a hard fuel a low melting point, the blast being equal in volume with both fuels.

To do good melting the melting point must be discovered and only a sufficient quantity of fuel placed in the bed to bring the top of the bed up to the melting point. When the fuel is hard anthracite coal the rule is to use a sufficient quantity of coal in the bed to bring the top of the bed 14 inches above the top of the tuyeres when the wood is burned out, with hard Connellsville coke 18 inches, and with soft coke 20 to 25 inches. But the melting point is varied by the volume of blast and these rules do not always hold good. So the melting point in each cupola must be learned to get the best results from the cupola.

To find the melting point a bed is put in according to the rule and iron charged upon it. If the iron is a long time in coming down after the blast is put on, or the iron melts very slowly during the melting of the first charge, but melts faster at the latter end of the charge and is hot, the bed is too high and the iron is being melted upon the upper edge of the melting zone. Fuel and time are then being wasted and the fuel should be reduced so as to place the iron at the melting point when melting begins. If the iron comes down quick but is dull, or if it comes slow and dull and does not grow hotter at the latter end of the charge, the melting is being done on the lower edge of the melting zone and the quantity of fuel should be increased to bring the top of the bed up to the melting point. When the top of the bed is placed only half way up the melting zone the iron comes down hot and fast, but the bed does not melt the quantity of iron it should and the latter part of the charge on the bed is dull. The latter part of the charge on the bed when the bed is the proper hight is also dull if the charge is too heavy for the bed and care must be taken in noting this point.

If by comparison with the charges of iron in various size cupolas the charge on the bed is found to be light, the bed should be raised until the melting indicates that it is at a proper hight; then the weight of iron on the bed may be increased, if the charge is too light When raising or lowering a bed, it should be done gradually by increasing or decreasing the fuel from 50 to 100 pounds each heat until the exact amount of fuel required in the bed is found. If the changes in the bed are made gradually in this way, the effect of the changes upon the melting may be observed more accurately and better results obtained than when a radical change is made by increasing or decreasing the fuel in large amounts at one heat. When the amount of fuel is found that brings the top of the bed to a hight that gives the best results in melting, the top of the bed is maintained at that point each heat.

When a cupola is newly lined the diameter is decreased from what it was with the old lining, and the weight of fuel in the bed must be decreased to bring the top of the bed down to the melting point, and as the lining burns out and the cupola gets larger the fuel must be increased to keep the bed up to the melting point. Trouble is often experienced in melting after a cupola has been newly lined. This is because the diameter of the cupola is reduced from 6 to 10 inches, and the bed and charges are not changed to correspond with the reduced size of the cupola. There is never any trouble of this kind in foundries where a cupola book is provided and a record kept of the melting from one year's end to another, for the melter or foreman can look back and see the weight of the bed and charges when the cupola was newly lined and the increase made in the weight as the lining burned out and the diameter increased.

No definite or even approximate weight can be given of the amount of fuel required for a bed in cupolas of different diameters, for the tuyeres are placed at such a variety of hights above the sand bottom that for two cupolas of exactly the same diameter twice the quantity of fuel may be required for a bed in one as is required for a bed in the other. Cupolas with two or three rows of tuyeres require a larger amount of fuel for a bed than cupolas with but one row, but the same general directions for burning and managing the bed apply to all cupolas.

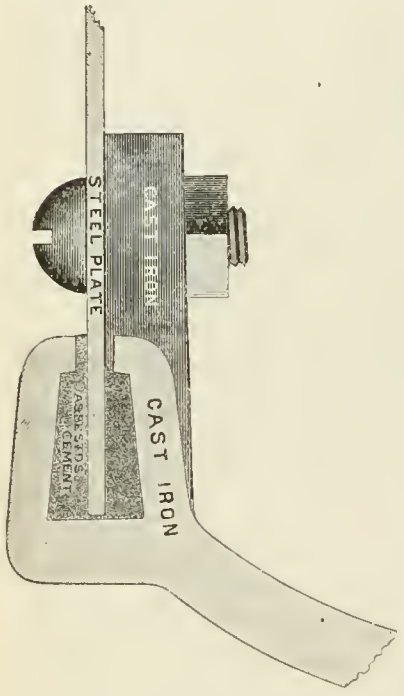
*Copyrighted, 1894, by Dr. Edward Kirk.

AT LANSING, MICH., on the 10th inst., E. Bement & Sons' extensive manufacturing establishment was damaged by fire to the extent of about $10,000. The blaze orignated from an oil furnace in the blacksmith shop, and completely gutted that building. Excellent service was rendered by the fire department and the adjoining buildings were saved. About 50 persons were employed in the blacksmith shop

who will be temporarily out of work. The building was a brick structure, 82 x 250 feet in size, and was insured for $4500. The walls are left standing and the loss is more than covered by the insurance. There is, however, quite a heavy loss upon the machinery and tools, some of which were quite valuable. The shop will be rebuilt at once.

A Gas Tight Joint.

The accompanying cut is reproduced to illustrate the care taken in the details of furnace construction by Schwab & Sercomb of Milwaukee, Wis., manufacturers of Gilt Edge furnaces. It shows an absolutely gas tight joint connection of the steel plate with the cast iron parts of the furnace. This is an improvement introduced by the firm this season. The connections of the steel



A Gas Tight Joint.

plate of both the dome and the radiator with the cast iron dome top and cast iron spider, also of the cast iron drum rings of the radiator, are constructed with a double flange and a lip on the inside of either flange, thus forming a perfect groove, which is filled with fibrous asbestos cement, and on account of the inside lips is unable to become loosened. Between the two flanges is inserted the steel plate, against which the lips of the groove are tightly pressed and held, thus forming a gas tight joint and always holding the steel plate in position. This method of construction, we understand, is exclusively used in the Gilt Edge furnace.

The Excelsior Furnace Warehouse.

The Excelsior Steel Furnace Company are now removing to their new building, at 38 West Monroe street, Chicago. The offices are already located in the new quarters and good progress has been made in the removal of machinery and stock. The new building consists of five stories and a basement and occupies a lot 200 x 50 feet, thus affording about 60,000 feet of floor space. The company at present have possession of but half the building, a portion being occupied by other tenants whose leases expire shortly, when all will be occupied by the Excelsior. The space then under their control is expected to be sufficient to permit of considerable growth in their business. The building is of mill construction, is comparatively new and well adapted to the company's purposes. Although in the middle of a block it has a large central light shaft, which enables every part of it to be used by workmen. The floors are 5 inches thick. Three floors will be used for manufacturing and the other three for storage. A 2-ton elevator is located in the front of the building and a 5-ton elevator in the rear, enabling goods and raw materials to be handled in and out easily. A 24-foot alley extends along the rear.

The offices are located in the front of the second floor. The remainder of this floor is used for the storage of furnace fittings and supplies. The stock of fittings carried is so immense and so many racks are needed to keep each kind separate that this part of the floor has been made into two stories, which is permitted by the hight of the ceiling. Galleries are built to give easy access to the upper tiers of racks. Furnace repairs are carried in racks built near windows so as to give them good light. In the rear are stored parts of furnaces, so arranged that on a call for a furnace of a certain size all the parts can be assembled with few steps and conveniently to the elevator. Steam and hot water radiators are also stored in the same vicinity. The list of articles kept by the company will be continually extended, with the fixed intention to carry such a stock that there will not be a single thing needed by a furnaceman that cannot be obtained from this house. This description of the second floor shows what will be done on the other floors used for storage purposes when the company's plans are fully worked out.

History of a Stove.

The following account of an old stove is taken from a recent issue of the *Troy Daily Press*:

Marcus L. Filley, president of the Green Island Foundry Company, received a letter to-day from Von R. Van Raub of Van Raub, Bexan County, Texas, which contains an interesting tale about a stove. The letter is addressed to Newbury, Filley & Co., the original stove firm on Green Island, and the writer expresses his doubts as to whether it will ever reach its destination, the address being taken from the stove, which is an antique. The story is best related in the words of the writer. He says: "I am a traveling man and noticed the other day in the wilderness of this State an old stove made by Newbury, Filley & Co. The stove has been in one family 40 years, and was purchased from a gang of outlaws who had used it ten years. It has been in constant use more than 50 years and is in good shape yet. My object in writing you is to settle a dispute, as some say the stove is only 60 years old, while others have its history for 88 years. The stove has no date of manufacture, or patent date, and I suppose it was made before the United States Patent Office was instituted. The only inscription it bears is 'Newbury, Filley & Co., Troy, New York,' and over the oven doors 'Diamond Rock.' The stove has seen much blood spilled around its hearth, according to the stories, having been owned by a tough band. Until recently it has been 580 miles from a railroad, and when delivered originally it had to be conveyed 2000 miles by wagon." The writer states that if Mr. Filley desires to purchase the stove for a relic he can procure it for him. He gives as reference any business man in San Antonio, Texas. Mr. Filley says the letter reminds him of an incident connected with his first sale of a stove in Texas. It was disposed of to a family residing several miles from town, and a few days after the sale the head of the family drove to Mr. Filley's hotel and informed him that he wanted his money back, as the "blamed thing wouldn't work." Mr. Filley went with the man to his house and found that he had been building a fire in the oven and attempting to cook his victuals on top.

ODD PLATES.

Some of the local papers have been making mention of the name of Lazard Kahn of F. & L. Kahn & Bros., Hamilton, Ohio, as a candidate for Congressional honors. If we are correctly informed, this is not the first time that such use has been made of his name, as for the past three years leading politicians of that section have recognized him as a man of brilliant accomplishments, a man well versed in all phases of life, and one eminently fitted to serve in Congress with honor to himself, party and country. In reply, however, to the direct question by the representative of a local paper if he would be a candidate for Congress, Mr. Kahn said he would not, neither could he allow his name to be used in such connection.

F. M. Borden & Bro., 118–122 North Second street, Philadelphia, Pa., are sending to the trade their New Process catalogue for 1894, showing the various gasoline stoves they handle under that name. It is accompanied by folders showing the Splendid Novelty vapor stoves, both the high generating and the low or junior styles, with ovens, broilers, cookers and other kitchen furniture.

In a recent issue of the *Progressive Age* is an article showing the profits derived from the rental of gas stoves by a gas company operating in a far Western town of about 50,000 people. The stove business of the company dates from October 1, 1892, the statement covering the operations of one year. During that period 265 stoves, heaters and appliances were sold and 147 rented, making a total of 412. Of these 206 were on separate fuel meters, and the statement therefore covers only the business done in connection with 206 stoves. The revenue derived from the gas consumed at $1.50 a thousand cubic feet, and from the rental of 147 stoves at 49 cents per month, is given as $10,653.36. The cost of the gas, interest on the investment in rented stoves, depreciation on the latter at an average life of five years, cost of setting 59 stoves which were sold outright and interest on the investment in fuel meters was $6141.54 leaving a net revenue of $4511.82.

The Ringen Stove Company of St. Louis, Mo., have issued a notice to the trade to the effect that arrangements have been made with Ralph S. Buck of San Francisco, Cal., to represent the company in Central and Northern California, in the interest of the Quick Meal gasoline and gas stoves. Mr. Buck will carry a full assorted stock in San Fran-

cisco so that customers may be assured of immediate shipment upon receipt of orders addressed to the company's representative at that point. With the announcement to the trade is inclosed a copy of a small pamphlet such as the company are furnishing in liberal quantities for distribution. It shows the general appearance of the Quick Meal gasoline stove for 1894, as well as tells the story of the "Quick Meal pie" The company state that as the season is well advanced and the business has not heretofore been handled by them direct they are not thoroughly posted as to who have been Quick Meal agents throughout Central and Northern California. To ascertain this the manufacturers inclose a postal card addressed to Mr. Buck with the request that it be filled out and mailed to him, stating what gasoline stoves were handled in 1893.

E. L. Black of Mount Vernon, Ohio, favors us with a copy of a little catalogue relating to the Comfort warm air furnaces, which he manufactures, adapted for soft coal, coke or hard coal. The heater is described at some length, and illustrations are presented showing the appearance of the furnace with the brick work removed, and also the construction of the grate. The latter is an important feature, as it is so arranged that one half the grate surface may be dumped, while the other half remains undisturbed. As the manufacturer puts it, "the grates are shaking and at the same time dumping endways." The catalogue contains, in addition to an illustrated description of the furnace, numerous testimonial letters from some of those who have used the goods, together with tables of prices and of dimensions and capacity of the Comfort hot air heaters. Mr. Black states that he has had a very good trade in these goods during the past year, and that every 12 months the volume of business has shown a gratifying increase.

The Joliet Stove Works, Joliet, Ill., have issued a very neat folder illustrating and describing Moore's ranges, for which strong claims are made. The stoves, embodying the modern improvements, are decorated in a tasteful and effective manner and are claimed to be standard in all that the name implies. The makers state that in every respect Moore's ranges are first class, being made in a "first-class shop by first-class workmen from best grades of pig iron and molded in Albany sand." The fourth page of the folder calls attention to Moore's Fidelity range, which is a six-hole construction especially designed for soft coal. It has large flues, heavy linings and improved shaking and dumping grate, large ash pan, gray enameled reservoir, high square oven, giving full measure on the bottom. Moore's Matchless is a four-hole range, also designed for burning soft coal. It is the same as the Fidelity with the exception of the top.

The Lebanon Stove Works, Lebanon, Pa., recently suspended operations for the purpose of making repairs. According to a local paper the engine, which is planted on marshy ground, has been found to be out of plumb, and in consequence will have to be raised a trifle. The foundry is being repaired under the management of Superintendent Reilley, work having been commenced the early portion of the week.

We are indebted to J. Van Wormer & Co., Albany, N. Y., for circulars relating to the new lines of Astral ranges which they are offering the trade. Under the name Ideal Astral, they have brought out a new four-hole range constructed from the latest style of patterns and embodying the modern improvements. The decorative features are neat and attractive and the stove is offered in four sizes square and four sizes with reservoir. The Astral B is a medium priced range made in four sizes square and three sizes with reservoir. The Prize Astral is a new six-hole range having sectional top, cut long centers, duplex grate for coal and basket grate for wood, large oven, double cemented bottom, extra large fire box and ash pan and flush reservoir top. It is made in four sizes and the usual varieties.

The Richmond Stove Company of Norwich, Conn., resumed work on Monday, February 19, after a shut down of three weeks.

About two months ago some of the molders of the Smith & Anthony Company, whose foundry is located at Wakefield, Mass., refused to work under a reduction of wages. They recently decided, however, to recede from their position, and on Tuesday of last week accepted a reduction of about 8 per cent.

The W. J. Loth Stove Company, successors to the Waynesboro Stove Company of Waynesboro, Va., send us a copy of a supplementary catalogue which they have issued relating to the Blue Ridge cook stoves, ranges and heaters. The pamphlet is of 24 pages bound in colored paper covers, and contains, in addition to illustrations of the various lines mentioned, ample descriptive letterpress, together with prices of the various sizes in which the stoves are made. The opening pages are devoted to the Blue Ridge Fannie, a new and cheap five-hole range for coal or wood; the F. F. V., a four-hole cook stove made in six sizes; the New South, another member of this class; the Blue Ridge Franklin, a new open stove with nickel trimmings and embodying the modern features of construction; the Templeton, an attractive cottage parlor stove made in three sizes; the Valley, a new dwarf or monkey stove, also made in three sizes; the Mascot and Antrim cannon stoves, and the Carey, a new style box stove in four sizes. Several pages are devoted to price-lists of hollow ware, &c.

Harry King has just returned from a trip through the West for the Kernan Furnace Company, Utica, N. Y., and is about to make a similar trip through New England.

Schill Bros., Crestline, Ohio, have completed arrangements with Davis, Johnson & Co., 45 Jackson street, Chicago, Ill., for the exclusive sale of their New Idea furnaces in the States of Illinois, Iowa, Wisconsin and Missouri, in each of which they have a representative who thoroughly covers the ground. Schill Bros. have received for their first spring allotment an order for 200 furnaces, which includes a full line of the New Ideas to be kept in stock. All orders for the States referred to are filled from the Chicago establishment. The reports from headquarters received through their agencies in other sections are of the most flattering character.

At a recent meeting of the Art Stove Company, Detroit, Mich., Theodore Miller was elected president, Neil McMillan treasurer and H. Leonard Wilton secretary. The traveling salesmen of the company are on the road at the present time, and the manufacturers state that their new lines of stoves and ranges are about ready to be placed on the market. The company have increased their capital stock to $200,000.

The Quick Meal Stove Company of St. Louis, Mo., have issued a little catalogue relating to Quick Meal gas stoves and ranges, as well as ovens, sad iron heaters, broilers and saucepans. The pamphlet is of a size convenient to carry in the pocket and is bound in colored paper covers, a space being left at the bottom of the front page for the business card of the dealer handling the company's goods. The latter are illustrated and described at some length, and the general make up of the pamphlet is such as to interest the reader.

"The Stove Repair Order and Record Book" is the title of a volume which reaches us from Daniel P. Holmes of Norwich, Conn. As its name indicates, it is intended for the use of dealers in ordering stove repairs. The printing is upon one side of the page only, each leaf being divided into two parts by a dotted line running from top to bottom, the idea being to tear out the part carrying the order and mail it to the repair dealer, while the other portion remains as a stub in the book. Each order is also given a number, which the repair man is requested to mark upon each casting, while if the order cannot be filled the slip is to be returned. The book is copyrighted by Mr. Holmes and copies are sold at 50 cents each.

The Cleveland Co-operative Stove Company of Cleveland, Ohio, have brought out a new heater for the season of 1894, known as the Cleveland Oak. This is regarded by the manufacturers as one of the most complete stoves of its class ever constructed and they expect it will meet with extended favor at the hands of the trade.

The Fuller & Warren Company, Troy, N. Y., send us a special illustrated catalogue of warm air furnaces and combination warm air and hot water heaters. Within its covers a telegraphic code is given, together with illustrations and descriptive particulars of the goods named. There are also tables of prices, diagrams showing how furnaces should be set, together with directions of interest in this connection. The catalogue is arranged with a view to meeting the requirements of the trade and is bound in colored paper covers. The company furnish at the back of the volume a blank form which can be filled out by any one desiring an estimate upon one of the maker's furnaces.

A colored circular with letters in white has been issued by the Peninsular Stove Company of Detroit, Chicago and Buffalo, referring to their French drop oven door. The door is in two parts, the upper half a swing door and the lower half a drop door with patented spring steel hinge. When the drop door is open it forms a strong flush oven shelf, while the swing door remains closed and retains the greater part of the heat otherwise lost. This makes it economical, and, it is pointed out, the oven does not cool off and interfere with the baking every time the door is opened. The circular is ornamented with representations of the company's trade-mark. We have been shown a remarkably strong testimonial of the Novel Peninsular cook stove, written by one of the company's customers. In

it he not only alludes to the admirable operating qualities of this stove, but also dwells with special weight on the drop oven door, which is alluded to as a very strong feature in assisting in its sale.

R. Robinson & Sons, 105 Lake street, Chicago, have issued a four-page leaflet descriptive of their line of Superior vapor stoves. These stoves have been greatly improved for 1894. The process stoves are made with brass burner drums highly nickeled, and with cast tops and bottoms. The sub-flame now used is a great improvement, making the stoves work perfectly. All their stoves have plated needle points, glass drip tubes to show the flow of gasoline, nickel tank rests, &c. They are well designed and handsomely ornamented. The line comprises a cabinet process range, with or without a shelf; an open frame process stove with two or three burners, a single generator stove with two or three burners, and high and low juniors in the usual sizes.

The Michigan Stove Company make telling use of the slang expression "a corker" in some advertising matter they are now distributing. A flat piece of cork, cut in the shape of a champagne cork and bearing on it the inscription above quoted, is glued to the top of a very handsomely printed card which calls attention to the merits of Garland stoves and ranges. The card is tinted pink on one side and yellow on the other, and is sent though the mails as an enlarged postal card. The design is quaint and impressive, the use of the slang term being very ingeniously worked up.

A press dispatch from Massillon, Ohio, announces that a fire destroyed, on February 19, the pattern storehouse of Hess, Snyder & Co., makers of stoves, windmills, &c., in that place. The loss is estimated at $5000, partially covered by insurance.

The Gobeille Pattern Company, Cleveland, Ohio, send out a postal card telling the trade that nothing is so costly as a small pattern shop without a lot of work ahead. Those who have shut down their pattern shops are invited to send to the Gobeille Pattern Company before starting them up again. In a little circular they say: "It is just as foreign to a foundry or machine shop to make its own wooden patterns as it would be to make its own emery wheels or to print its own stationery."

The Utica Stove Repair Company have sold out their entire business to Goodenow & Morehouse, Utica, N. Y., who will continue it in connection with their stove and tin trade.

The big tower at Wembly Park, near London, England, designed to rival the Eiffel Tower, is completed to the first platform, which forms the base of the actual shaft, and the work is being pushed with energy. England, it is announced, is also to have a gigantic wheel after the model of the Ferris Wheel. It is to be set up, says the report, near London, and will be 300 feet high, have 40 passenger cars attached to its circumference, and the tower supporting it will have eight platforms, fitted with restaurants and dancing floors.

In spite of the hard times more anthracite coal was mined and sold in 1893 than in any other year, while the average price obtained was higher than that of several years previous.

Trade Notes.

The page announcement this week of Sam S. Utter, 113 Beekman street, New York, tells the trade about his Game gas stoves, also Game oil stoves and Summer Girl lamp stoves.

The large Tin Can and Japanned Ware factory of Norton Brothers, occupying half of the triangular block facing on Dock and Water streets, Chicago, was destroyed by fire February 19. The direct monetary damage is estimated at $200,000. The firm have another large establishment at Maywood, from which they will be able to supply most of their specialties.

Fred J. Meyers Mfg. Company, recently of Covington, Ky., have, since February 1, been installed in their new factory, built during the past year at Hamilton, Ohio. These buildings cover, it is said, 4½ acres of ground, and the company allude to the plant as the largest in the country for the manufacture of their line of goods. There are two lines of railroads running directly into the works. The company have about finished, we are told, a large storeroom in which to accommodate finished stock. It will be remembered that this concern were burned out March 4, 1893, and since that time have been building the plant just occupied. As an inducement to come there the town, we are advised, donated the ground on which to erect the buildings. They are now in a position to execute any orders in their line. Their Eastern headquarters are at 69 Beekman street, New York, F. J. Mattison, agent.

In their advertisement elsewhere in this issue the Bailey-Farrell Mfg. Company, Pittsburgh, Pa., direct attention of the trade to the Eureka Smoke Test Machine, an illustration of which appeared in *The Metal Worker* of February 17. The price of this machine is given as $15, and the trade are requested to send for descriptive circulars.

A destructive fire, which broke out in a large business block in St. Louis, Mo., on Thursday last, claimed among its victims the Udell Woodenware Company of that city. Their warehouse and store, holding a large stock of goods, valued at $100,000, were, with their contents, demolished by the fire. The loss, which was complete, is stated to be fully covered by insurance. The Udell Woodenware Company were burned out a year ago, and recently began business anew in the building just destroyed.

A steel ship of great cargo carrying capacity, to be named the "Dirigo," is about to be launched at Bath, Maine, and as soon as the ways are clear another is to be laid down. The future of these Maine built steel vessels will be watched with interest, observes the Boston *Transcript*, for if they return a handsome profit to their owners, the fact will demonstrate that a great New England industry need not leave New England in order to enable it to procure raw material at prices consistent with a good return on labor and capital.

A new lodge of the Amalgamated Association has just been organized at Gas City, Ind. It is claimed to contain 75 members.

Trade of Principal Ports.

The Bureau of Statistics, at Washington, has just issued a comparative statement of the values of merchandise imports and exports, by customs districts, for the years 1893 and 1892, which shows that little change took place in the relative position of the principal commercial ports of the United States during the past year. The figures for all ports the imports and exports of which exceeded $10,000,000 in value are given as follows:

Imports.

	1893.	1892.
New York	$492,100,000	$539,800,000
Boston	69,100,000	75,500,000
Philadelphia	58,800,000	63,200,000
San Francisco	39,400,000	45,600,000
New Orleans	21,100,000	18,800,000
Chicago	17,700,000	17,000,000
Baltimore	15,000,000	14,100,000

Exports.

	1893.	1892.
New York	$357,900,000	$377,700,000
New Orleans	85,200,000	107,600,000
Boston	83,500,000	88,800,000
Baltimore	74,800,000	91,900,000
Philadelphia	43,500,000	60,300,000
Galveston	35,900,000	35,600,000
San Francisco	28,800,000	31,700,000
Savannah	23,500,000	20,300,000
Charleston	11,000,000	11,300,000
Norfolk	10,600,000	8,300,000
Newport News	10,500,000	11,600,000

The total of merchandise imports for the whole country for 1893 shows a shrinkage of about $64,000,000 and the exports a decrease of $62,000,000 as compared with 1892. In imports there is no change in the order of the seven ports named, but New Orleans, Chicago and Baltimore alone show any increase, while the four most important receiving ports—New York, Boston, Philadelphia and San Francisco—all exhibit a material falling off. In the case of exports, the only changes in the relative rank of the principal shipping ports during 1893 are that Boston, by virtue of a lesser shrinkage in her exports than is shown by Baltimore, goes ahead of that city, taking the third place after New York and New Orleans, while Norfolk, which did not appear on the list last year, takes precedence of Newport News. All the Southern ports except New Orleans make a fair showing, while the Northern ports uniformly reflect the business depression of the year by a shrinkage of more or less magnitude in their shipments.

Taken as a whole, remarks the New York *Journal of Commerce*, the year's record is notable rather as an evidence of the extent to which even the most distant ports and the commerce of the whole country reflect the same influences, than as an indication of any remarkable development of new branches or routes of trade, or changes in the relative commercial importance of different cities or sections.

In the course of a paper on the magnetic concentration of iron ore, before the Engineers' Club of Philadelphia, Edward K. Landis reported that in 1882 he had occasion to make some very interesting experiments with a small model of the Anvil Furnace of the Pottstown Iron Company. Among other curious facts it was clearly demonstrated that the distribution of fine ore in a furnace was governed principally by the size of the bell, but was also influenced by the fluctuation of the stock line, showing that with a correctly proportioned bell and the maintenance of the stock at the proper line any modern furnace should handle the ordinary concentrated ores crushed to ¾ or ½ inch mesh without the least difficulty.

TRADE REPORT.

The Iron Market.

The situation is somewhat monotonous, although it is encouraging to find that the volume of business is gradually increasing. In saying this it is not to be supposed that there is any great activity, or that the mills are running full time, which would be far from the truth. Some mills are doing an average business, some are doing half to two-thirds, some are doing absolutely nothing, so that, taking it all around, there is not more than 50 % to 60 % of the normal output. Considering that this is 15 % to 20 % better than during the latter portion of 1893, it is clear that the tendency is toward improvement.

The same estimate would probably apply to the foundry trade, as well as to other branches, so that while there is improvement, and the current is in the right direction, the situation is still very far from being what it would be in ordinary times.

Pig Iron.—Some additional lots of cheap Southern Iron have been sold in the New York market at prices in keeping with the low figures referred to last week. Otherwise none but routine business has passed, and the demand, as generally reported, continues tame. Prices have undergone no decided change, but the leaning is, if anything, still in buyers' favor, since livelier interest is shown by sellers than by buyers. Particularly is this the case with low Foundry and Mill grades. We quote standard brands $13 @ $13.50 for No. 1; $12.50 @ $13 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $13.50 for No. 1; $11.75 @ $12.50 for No. 2; $11.50 @ $12 for No. 3; $11.50 @ $11.75 for No. 2 Soft, and $12 @ $12.50 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10 75 @ $11.25.

The Philadelphia Pig Iron market is somewhat unsettled by reports that contracts for Ore have been made at unprecedentedly low prices. The present outlook is very discouraging to the owners of furnaces in Eastern Pennsylvania. The foundry trade is about all they have to depend upon, and as that is to some extent supplied by Southern and Central Pennsylvania furnaces, the pickings look very small compared with what they were a few years ago. As regards the immediate condition of the market, there is little to be said except that it is dull and prices barely steady. Stocks are not unduly large, but sellers seem to be willing to meet all demands at current quotations, which for Philadelphia and equivalent points are about as follows:

No. 1 Foundry	$13.00 @ $13.50
No. 2 Foundry	12.50 @ 13.00

Chicago advices intimate that more than an average week's business has occurred in local Coke Iron and sellers talk very hopefully of prospects for more trade. The bulk of transactions, however, continues to be in small lots, as the disposition to contract ahead is not general. Among the sales made the past few days were some which have cut still further into the Southern Iron trade. Foundrymen are changing their proportions of local and Southern Iron and now making the bulk of their mixture of the former. The aggregate of small sales of Southern Iron was fair during the week, but, so far as reported, no large contracts have been made. Quotations are given as follows, for cash:

Lake Superior Charcoal	$15.30 @ $15.50
Local Coke Foundry, No. 1	12.00 @ 12.50
Local Coke Foundry, No. 2	11.50 @ 12.00
Local Coke Foundry, No. 3	11.00 @ 11.50
Local Scotch	13.00 @ 13.50
Ohio Strong Softeners No. 1	15.00 @ 15.50
Southern Silvery, No. 1	@ 13.75
Southern Silvery, No. 2	@ 13.25
Southern Coke, No. 2	11.50 @ 11.65
Southern Coke, No. 3	11.00 @ 11.50
Southern, No. 1, Soft	11.50 @ 11.65
Southern, No. 2, Soft	11.00 @ 11.50
Tennessee Charcoal, No. 1	16.00 @ 16.50
Tennessee Charcoal, No. 2	@ 15.00
Alabama Car Wheel	18.00 @ 18.50
Jackson County Silvery	16.00 @ 16.50
Other Ohio Silvery	15.00 @ 15.50

The Pittsburgh Pig Iron market was extremely quiet during the week, no transactions of importance coming to the surface. Allegheny County is now making more Iron than at any time since last summer. We quote as follows:

No. 1 Foundry	$11.50 @ $11.75, cash
No. 2 Foundry	10.75 @ 11.00 "

There has been a light volume of trade in Southern Pig Iron markets during the week, not because of any scarcity of stock, but because there were no buyers of large lots, either for spot or forward delivery. There was small increase in the demand from the smaller foundries for current consumption, which was freely supplied at previous quotations and at the close there are more free sellers of all kinds of Southern Iron and it is believed that buyers could obtain concession of 25¢ ℔ ton, although there have been no transactions on which to base such a quotation. A large rolling mill has been started up in Birmingham, Ala., and it is pretty certain that low prices were made for the new material to be used, a part of which is Steel Billets from Pittsburgh. The primary object was to get the mill into operation, and if low rates were made on Pig Iron it was only to a moderate extent and seems not to have affected prices in the district at large. There is no increase in the demand for Charcoal Iron, but the whole tone of the market is easy, especially for the lower grades. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$11.25 @ $11.50
Southern Coke, No. 2	10.25 @ 10.50
Southern Coke, No. 3	9.75 @ 10.00
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.25 @ 14.50
Lake Superior Coke, No. 1	13.00 @ 13.50
Lake Superior Coke, No. 2	12.00 @ 12.25
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.50 @ 14.00
Tennessee Charcoal, No. 2	12.50 @ 13.00
Standard Southern Car Wheel	16.75 @ 17.75
Lake Superior Car Wheel and Malleable	16.50 @ 17.00

Metal Market.

Pig Tin.—Prices have ruled a fraction lower on Straits Tin for prompt and near future delivery, or, say, on the basis of 19.40¢ @ 19.45¢, net cash, for 5 ton lots. The concession has failed to excite livelier buying on the part of dealers or consumers and proved quite as ineffective as an inducement to speculative operations. Some exceedingly low selling prices on distant future deliveries have been reported with like result. The popular explanation of the unusual inactivity is the effect of the uncertainties of tariff legislation, particularly in view of the large holdings in European markets, the considerable amount of stock in bonded warehouses here and late heavy shipments from the primary sources of supply. During the first half of February no less than 1875 tons were sent out from the Straits as against 1125 during the corresponding period last year. In connection with heavy January shipments from the Straits and the fact that the shipments thence last year were nearly 10,000 tons in excess of the movement during the year 1891, this would seem to be a reasonable explanation of the dull condition of the market and general hesitancy and indecision prevalent at the present time. Jobbing business is extremely quiet, consumers restricting their orders to the narrowest possible limits.

Copper.—There have been some signs of more active business in this line. Few facts come to the surface, since the leading operators cling to the idea that the "mysterious" is the best policy, but rumor has it that not only the leading Lake Superior companies but some producers of the lower grade metal have taken quite liberal orders and that the prices were lower than any that operators on 'change have ventured to offer at. The facts in this connection

however, remain hidden. Hence all that can be said is that the rumor has to go for what it is worth. Pending developments, the popular quotations are 9⅝¢ @ 9¾¢ for Lake Superior Ingot, 9½¢ for Electrolytic and 9⅛¢ @ 9⅜¢ for ordinary casting brands. There is little indication of any expansion in the demand from smaller consumers for either Ingot or Manufactured Copper, purchases of all kinds continuing on strictly conservative lines. Jobbers' prices are, nevertheless, fairly steady at the low level now ruling. Cornice makers have an unusually light amount of work on hand at present, but a considerable number of substantial orders are said to be pending which should materialize before many weeks, provided confidence, in the building trade, is sufficiently restored to admit of certain suspended and deferred operations being carried out.

Pig Lead.—The softness that came prominently to the front last week has become more pronounced since and the market at this writing is, to the best of it, looking rather depressed. There are sellers at 3.25¢, and few, if any, buyers. There are requests for bids of 3.20¢ and the response is almost inaudible. There were a few offers of 3.15¢ for single carload lots, prompt or near future delivery. A very light consumptive demand for Pig is reported by dealers and jobbers. Lead Pipe and Sheet Lead are equally quiet, and prices for small lots incline to weakness.

Spelter.—Irregularity has been the prominent feature. Western advices go to show that the effect of late speculative deals there has worn off; that the proposed reduction in output has been well discounted and that there are yet a few more tons unsold. In the face of extremely high prices quoted from St. Louis it has been no difficult matter to purchase good Western brands at 3.90¢ @ 3.95¢, delivered here. In speculative quarters there were offers of carload lots at a shade less for delivery this month and next.

Sheet Zinc.—Business has been entirely commonplace. As noted in another column, manufacturers' quotations on Sheet Zinc have been advanced slightly. Jobbers' prices for small quantities remain, however, unchanged for the present.

Antimony.—There is about the usual movement. Prices remain steady. For small lots Hallett's is quoted at 10¼¢ and Cookson's at 10¾¢.

Tin Plates.—Business in all classes of Plates has been irregular, but without improvement in any direction. Spot goods are being taken in a very moderate way only, despite the fact that holders are in many cases offering them at a reduction of 5¢ @ 10¢ a box below the lowest quoted rates. Little or nothing of any moment has been done in regard to future deliveries, even though every inducement is offered in the way of price. Practically buyers rule the market, which can only be described as weak and low, with trading far below the average for this season of the year. "Free" stocks in the hands of importers and jobbers are remaining generally low; but considerable quantities of Plates are held in hand and only drawn out as required, pending the expected readjustment of the tariff.

A London cable dispatch to *The Iron Age* of February 21 describes the British Tin Plate market as quiet. Some speculative inquiry prevailed for far forward deliveries, but buyers' ideas were much below ruling prices, and little business was effected. More mills are being closed down owing to lowness of prices. Sales have been made of ordinary Bessemer Cokes, 14 x 20, at as low as 9/9, f.o.b. Wales, and on other sorts prices average 1½ pence lower than they have been recently, on moderate sales. For Ternes and Black Plates the market is very dull. Stocks of Plates at Swansea are now about 229,000 boxes. Liverpool prices are quoted as follows:

IC Charcoal, Alloway grade	12/3 @ 12/9
IC Bessemer Steel, Coke finish	10/6 @ 11/
IC Siemens " " "	11/ @ 11/3
IC Coke, B. V. grade, 14 x 20	Nominal.
Charcoal Terne, Dean grade	10/3 @ 10/9

Sheet Iron.—Sheet Iron manufacturers generally appear to be busy and several mills have been put into operation quite recently to meet orders. In some quarters it is claimed that enough orders have been booked to keep the mills busy until summer on both Black and Galvanized Iron. However this may be, it is certain that some large consumers have awakened to the desirability of anticipating their wants at the low prices now ruling, as some considerable orders have been placed with the mills during the past week or ten days. Meanwhile jobbers state that the demand for Sheet Iron from small consumers continues very languid and prices largely in buyers' favor. Black Sheets are particularly weak in this latter respect, but Galvanized Iron is inclined to stiffen. There is not much demand from cornice makers for the latter material, building operations being generally in abeyance. Black Sheets of light gauge for tinning purposes are very active, most manufacturers of this product being behind their orders and the demand increasing

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THE SHEET AND GALVANIZING DEPARTMENTS of the Soho Iron & Steel Works of the Moorhead-McCleane Company, at Pittsburgh, Pa., continue in full operation, giving employment to about 400 men. The other departments of this plant remain idle, with no prospects of immediate resumption.

THE BOORE MFG. COMPANY of Buffalo, N. Y., were recently incorporated, with a capital of $30,000, for the manufacture of patented gas regulators. The directors are: Lewis Boore, John E. Haas, John F. Diehl and others of Buffalo.

Chicago Report.

Scrap.—Iron and Steel are dull and neglected. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb.
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Very little movement is reported by dealers. Prices are somewhat firmer by action of the mining companies, but the schedule for this market is still being shaded. Carload lots of 12 net tons or over are nominally quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.	
Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

THE ATTENTION of our readers is directed to the eight-page advertisement of the St. Louis Stamping Company, St. Louis, Mo., which appears in this issue. These pages contain the reduced price-list of their well known Granite Ironware and also the standard list of their Imperial Enameled Steel Ware. These lists include every article they manufacture, both in Granite and Imperial Ware, and are arranged in a systematic manner, which will be appreciated by the trade. Many of our readers will doubtless preserve these lists, as they will be found extremely useful in ordering these well known goods. This company have recently issued a new catalogue of both Granite Ironware and Imperial Enameled Steel Ware, which will be sent to the trade on application.

DANIEL G. FRENCH & CO. of Chicago, manufacturers of and dealers in canners' machinery and supplies, contemplate the erection of a factory at Hoopeston, Ill., an important canning center, and the consolidation of their various manufacturing interests at that point. The Union Can Company have already located there as a convenient point for the manufacture of tin cans.

CONDITION OF THE

Hardware Trade.

BUSINESS CONTINUES to be characterized by the same general features as for the past week or two, with perhaps a slight falling off in the demand. This is regarded as owing to the fact that with the opening of the year a good many houses placed orders for the replenishing of their stocks, and this having been done there is a disposition to await the active opening of trade before purchasing further. The fact that the end of the month is approaching has also some influence on buyers. The general demand, however, continues fair and many of our advices indicate a continuance of the improved feeling which has been apparent since the opening of the year. With the large force of travelers on the road and the efforts which are being made by manufacturers and their representatives to secure orders, the aggregate volume of business is unquestionably fair, though not yet as large as under usual conditions is expected at this time. Prices are without important change, but the tone of the market is not strong; and notwithstanding the improved condition in Barb Wire and Wire Nails the tendency is toward lower quotations on some lines of goods, especially those that lie near the raw material. The desire of manufacturers to keep their works in as full operation as possible also has the effect of making them willing to shade prices in some cases. Under these conditions there is a marked absence of speculative buying and the trade are wisely pursuing the conservative policy which has characterized their operations for some time. Collections on the whole are probably in excellent condition, but some complaint is made of sluggishness in remittances.

Advices from Chicago.—Shelf Hardware jobbers in some cases report the best trade of the year now coming in, but others are not so well favored, finding their orders falling somewhat below those of last week. Jobbers of Tinware and related goods report the first three days of last week as showing a decided improvement in Tinware and tinners' stock, but later in the week trade fell off to some extent. The well-known establishment of Norton Brothers in this city was completely destroyed by fire on Monday evening, and it will be some time before the gap in the local trade thus created will be filled. The firm have another large establishment, however, at Maywood, from which they will be able to supply most of their specialties. The Heavy Hardware trade is spasmodic, days of fair business being followed by periods of dullness.

Notes on Prices.

Wire Nails.—The Wire Nail market is represented by the quotation of $1.10, for carload lots at factory, a price which is adhered to except in the case of unusually large and attractive orders. The market is characterized by an excellent tone, the mills being well supplied with orders, and some buyers being still in the market. There is also a good inquiry from other houses whose purchases are not so large, and the outlook for a continued demand is regarded as excellent.

Advices from Chicago.—Inquiries for Wire Nails are good and orders are being placed by buyers who had already contracted for what they supposed would cover their wants for the spring trade. The price on factory lots is now practically $1.20, Chicago, with some manufacturers asking up to $1.25. Quotations are being made for immediate acceptance, owing to the continued pressure for rapid shipments on contracts and the steady receipt of inquiries and orders. Jobbers report a good demand from their trade and quote mixed carloads at $1.20, while small lots from stock are selling at $1.25.

Cut Nails.—The Cut Nail market is in substantially the same condition as last week. The market in the East is represented by the manufacturers' quotation of $1.05, for carload lots on dock, New York, and the Western market by the quotation of $1.00 to $1.05, at mill. The price from store in New York is firm at $1.15.

Advices from Chicago.—The inquiry for Cut Steel Nails has improved considerably. Orders were quite freely placed during the past week from various parts of the territory tributary to this market. The Lakeside Mill started up on Monday with an accumulation of orders which will insure a steady run. Factory lots are quoted at $1.05, Chicago, on a 60 cent average, while small lots from stock are unchanged at $1.15 to $1.20.

Barb Wire.—There have been no important developments in the Barb Wire market since our last review, and the manufacturers are apparently adhering to the new and advanced prices. The market is thus represented by the quotation of $2.15, for carload lots of Galvanized Four Point, at Pittsburgh, $2.20 at Cleveland, $2.25 at Cincinnati or Allentown, and $2.35 at New York. There is a good deal of inquiry for Barb Wire and it is understood that some orders have been placed at the advanced prices.

Advices from Chicago.—The heavy storm last week, which was general throughout the Northwest, is credited with checking the demand for mill shipments of Barb Wire, so that the week compares unfavorably with the record of its immediate predecessors. This is expected to be made up shortly, however, as it is too late in the season for snow storms to influence trade unfavorably in a good portion of the West. Prices are now $2.30, Chicago, for carload lots of Galvanized, while small lots are selling from stock at $2.35 to $2.40. Jobbers report a continued excellent demand from the country merchants.

Wrought Iron Pipe.—The market for Wrought Iron Pipe is lower and somewhat irregular. This is owing to the light demand and the active competition for business.

Traps.—We are advised by the Oneida Community, Kenwood, N. Y., that they have withdrawn the discounts on their Traps, which were named in our issue of February 10, and instead of them announce the following:

	Per cent.
Newhouse	40 and 10
Hawley & Norton	70 and 5
Victor	70, 10 and 5
All Steel	75
Star	50 and 10

Rope.—With the moderate demand which has prevailed for some time the Cordage market has developed weakness and Manila can be purchased in large lots, f.o.b. factory or New York, at 6¾ to 6⅞ cents per pound basis, a price which is subject only to the cash discount of 1½ per cent. Sisal is also obtainable in similar lots at 4¾ cents, and Jute at 5 cents, in the present condition of the market Sisal Hemp being lower than Jute Hemp.

National Coffee, Drug and Spice Mill.—This article was described in our last issue as put on the market by the National Specialty Mfg. Company of Philadelphia. The mill is sold to the trade at $21 per dozen, subject to a discount of 30 per cent.

National Measuring Faucet.—National Specialty Mfg. Company, Philadelphia, are putting this article on the market, a description of which was given in a recent issue. The Measuring Faucet is sold to the trade at $36 per dozen, subject to a discount of 25 and 10 per cent.

Handy Holder.—The Handy Holders manufactured by H. C. Weidenmann, 3517 Wallace street, Philadelphia, Pa., are sold at $15 per 100, subject to a discount of 40 per cent. 30 days, with an additional discount of 5 per cent. for spot cash.

Glass.—There has been little change in the glass market during the past week, with no indications of any increase in prices. Demand has not been at all active, while the unfavorable weather during the past week has had a tendency to curtail orders. Factories have kept their production close to the demand, and there is but a slight increase in the number of factories in operation. There are indications of improved demand in Plate Glass, but prices, it is understood, are very low; in fact, it is difficult to obtain quotations except on specifications. It is reported that the low prices are attributable to a war now being carried on by the large companies engaged in the business. The New York Window Glass market is

represented by the quotation of 85 @ 85 and 5 per cent. discount for single strength Glass in small quantities, and 85 and 10 per cent. discount in car lota. Pittsburgh quotations are reported as being 85 and 10 and 5 per cent. discount for single and 85 and 20 per cent. discount for double strength Glass. It is understood that factories outside of Pittsburgh are making lower prices. A Muncie, Ind., concern quoted Window Glass under date of February 9 as follows: Single strength, 85 and 10 and 5 per cent. discount; double strength, 85 and 10 and 10 per cent. discount, freight allowed in carload lots.

Sheet Zinc.—Under date February 15, Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue revised quotations on Sheet Zinc. The price remains $4.50 per 100 pounds for Sheet Zinc in 600-pound casks, of the thicknesses between Nos. 9 to 15, inclusive, and of the widths between 32 to 46 inches, and of the lengths between 84 to 90 inches, and the extras also are unchanged. The following revised discounts are, however, announced:

Discounts.	First class. 15 600 pound casks, and upward.	Second class. 10 to 14 600 pound casks.	Third class. 5 to 9 600 pound casks.	Fourth class. Under 5 600 pound cakes.
	Per cent.	Per cent.	Per cent.	Per cent.
Special	4	4	4	4
Cash with order	3	3	3	3
Quantity	3	2	1	0
Total	10	9	8	7

All discounts are computed straight when money accompanies order, quantity discount being added to special discount in all cases. If remittance is received within 10 days of date of invoice the cash discount will be only 2 per cent. instead of 3 per cent., and not computed straight. Each order is strictly subject to the quotations of the class to which it belongs.

Old Metals.—Some more interest has been exhibited in some kinds of Scrap Iron during the week, but the movement has not been sufficiently extended to affect prices, which remain at their former low level. There is little doing in other kinds of Old Metals. The following quotations represent approximately the present prices paid by New York dealers:

Heavy Copper	℔ lb	7¢
Light and Tinned Copper	℔ lb	6¢
Heavy Brass	℔ lb	5¢
Light Brass	℔ lb	4¢
Lead	℔ lb	3¢
Tea Lead	℔ lb	2½¢
Zinc	℔ lb	2¼¢
No. 1 Pewter	℔ lb	13¢
No. 2 Pewter	℔ lb	6¢
Wrought Scrap Iron, ℔ gross ton	$7.00 @	$8.00
Heavy Cast Scrap, ℔ gross ton	7.00 @	8.00
Stove Plate Scrap, ℔ gross ton	4.00 @	5.00
Burnt Iron, ℔ gross ton	2.50 @	3.00

Old Rubber.—The market for this material remains very quiet. New York dealers' prices are nominally as follows:

Car Springs, ton lots, ℔ lb.	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.03
Rubber shoes, less than carloads, ℔ lb.	0.02¼ @	.03⅛
Large Hose, ℔ ton	@	9.00
White Wringer Rolls, ℔ lb.	@	.04¼
White Syringes, ℔ lb.	@	.05

Old Rags, Paper, &c.—While paper mills are fairly busy, the demand for paper materials does not increase to any appreciable extent, the mills being as a rule pretty well stocked. Business in Old Raga, Paper, &c., continues consequently dull and prices remain narrow. Quotations for New York delivery are nominally as follows:

No. 1 White Rags	℔ lb	3¼ @ 3½¢
No. 2 White Rags	℔ lb	2¼ @ 2½¢
Mixed Rags	℔ lb	⅝¢
Blues and 3ds	℔ lb	1 @ 1¼¢
Hard Sized White Shavings	℔ lb	2¼ @ 2½¢
No. 1 White Book Shavings	℔ lb	2 @ 2⅛¢
No. 2 White Book Shavings	℔ lb	1 @ 1⅛¢
Light Book Shavings	℔ lb	¾¢
No. 1 Mixed Shavings	℔ lb	¾ @ 1 ¢
No. 2 Mixed Shavings	℔ lb	½ @ ⅝¢
No. 1 Printed Books	℔ lb	1 @ 1¼¢
Ordinary Mixed Books	℔ lb	½ @ ⅝¢
Newspapers	℔ lb	2-5 @ ½¢
No. 1 Manila Paper	℔ lb	1 @ 1⅛¢
No. 2 Manila Paper	℔ lb	⅝ @ ⅝¢
Bogus Paper	℔ lb	⅜¢
Common Paper	℔ lb	⅜¢
Straw Chips	℔ lb	½¢
Binders' Clippings	℔ lb	½ @ ⅝¢
Jute Butts	℔ lb	1⅞ @ 2 ¢
No. 1 Jute Bagging	℔ lb	1 @ 1¼¢
Mixed Bagging	℔ lb	¾ @ 1 ¢
No. 2 Bagging	℔ lb	½ @ ⅝¢
Hemp Twine	℔ lb	2 @ 2¼¢
Manila Rope	℔ lb	2¼ @ 2⅝¢
Jute Rope	℔ lb	1½ @ 1¾¢
Mixed Rope	℔ lb	¾ @ ⅞¢

There is said to be a growing disposition among Northern cotton manufacturers toward removing to the South, so as to place themselves in closer proximity to the source of supply of raw material. It is calculated that an economy of nearly 16 per cent. would thus be secured. A number of Southern cotton mills are preparing to weave and finish goods in order to get them directly to the merchant who distributes them, thus saving the unnecessary expense incurred in handling the goods between the Southern spinners, the Northern weaver, the jobber, and the distributer.

The special police census of the unemployed in New York City shows the number of males out of employment to be 52,592 and of females, 14,688, making a total of 67,280. These persons belong to 41,981 families, comprising 206,701 persons in all.

United States Consul F. C. Penfield, at Cairo, Egypt, has notified the State Department that the Egyptian Government has announced an extension of six months for receiving bids for the proposed construction and operation of a system of street railroads in Cairo and its environs

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Metal and Miscellaneous Prices.

CHICAGO, FEBRUARY 22, 1894.

Tin—

Straits pigs ..... 22½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Cailand and MalynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20.	$5.65 @ $5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @ 11.50
X, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Kansal and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@
IC, 20 x 28	12.25 @
IX, 14 x 20	7.62½@
20 x 28	15.25 @

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	16.80
XX, 14 x 31	16.50	17.50
	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	36.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00
Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20	$7.00
IX, 10 x 14, 12 x 12, 14 x 20	9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal, extra. IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Flint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@ $11.50
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@ 12.50
Empire, IX, 20 x 28	@ 16.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@ $14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28	@ $17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@ $21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@ $19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	16.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Old Process:	
IC, 14 x 20	9.25
IX, 14 x 20	11.25
IC, 20 x 28	18.50
IX, 20 x 28	22.50
H. B. L., Old Style:	
IC, 14 x 20	7.75
IX, 14 x 20	9.25
IC, 20 x 28	15.50
IX, 20 x 28	18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 6-10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3-10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5-10¢
27	℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers	13¢ net.
Patent Planished	℔ A, 10½¢; B, 9½¢ dls. 5%
Craig's Polished Sheet Steel	8½¢

Galvanized.

Juniata or first quality ..... dis. 70&10%

Copper—

Ingot.

Lake	11¢ @ 11½¢
Casting Brands	10¢ @ 10¾¢

Sheet and Bolt.

Discount, 30%.

Copper Bottoms.

Discount, 30%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Olding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.

(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass	

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter 5

Sheet Zinc—

600 ℔ casks	4¾¢
300 ℔ casks	5 ¢
Loose sheets	5½¢

Lead—

Soft Pig Lead	3¾¢
Bar	4¼¢
Pipe	6½¢, dis. 10¢
Block Tin Pipe	35¢
Sheet	6¢, dis. 10%

Solder—

½&½	12¾¢@13¼¢
Extra Wiping	11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson	12¢ @ 12½¢
Hallett's	11¼¢@11½¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	60%
1¼ and under, Galv	52½%
1½ and over, Plain	70%
1½ and over, Galv	60%
Boiler Tubes, list Oct. 24, 1892	70%
Casing, list Nov. 16, 1892	62½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive ..... dis 70&10%

Other sizes ..... dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Ollbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list 50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list 70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1½¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6½¢
" Ground in oil, Red	℔ D, 6½¢
" Ground in oil, Brown	℔ D, 6½¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in obls	52¢
Linseed Oil, Raw, in bbls	49¢
Mineral Paints	2@4¢
Orange Mineral	9¾¢
Pure White Lead in Oil	6@6¼¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6¼¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7¾¢
Sipe's Japan Oil, in bbls, ℔ gal	84¢
Spirits Turpentine, in bbls., ℔ gal	38¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.80
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, FEBRUARY 23, 1894.

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal (guaranteed over 94% pure Aluminum), in ton lots ..... ℔ D, $0.60

No 1 (guaranteed to be 98 % pure and over), in ton lots ..... ℔ D .65

Lots less than 1 ton, 10¢ @ 12½¢ ℔ D additional.

Antimony—

Cookson	℔ D, 10¾¢
Hallett's	℔ D, 10½¢

Brass—

Planished	net
Roll and Sheet	25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per D.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

25@30%

Copper and Bronze Tubing—

3¢ ℔ D more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive	17¢ ℔ D
Over 3½ to 6 inches inclusive	18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive	18¢ ℔ D
Over 3½ to 6 inches inclusive	19¢ ℔ D

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz ..... 40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized	50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ..... 25@25&5%

Ingot.

Lake	11¢
Ansonia Grade Arizona	10¼¢
Ansonia Grade Casting	9¾¢

Planished ..... net

Sheet and Bolt ..... 25&25&5%

Tubes — See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized	60&10%
Lap or Slip Joint Terne	60%

Eave-Trough Mitres—

Lap or Slip Joint ..... list, net

Elbows—

Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized	35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.

Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2.70	3 ¢
Nos. 17 to 20	℔ D, 2.80	3.10¢
Nos. 21 to 24	℔ D, 2.90	3.20¢
Nos. 25 and 26	℔ D, 3	3.30¢
No. 27	℔ D, 3.10	3.40¢
No. 28	℔ D, 3.15	3.50¢
American B. B.	℔ D, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment	℔ D, 11¾@12¾¢
Patent Planished	℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel	℔ D, 8¼¢

Galvanized.

	B. B.
Nos. 10 to 16	70&5%@70 &10%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—

Lee's	33⅓%

Lead—

American Pig	3¾¢@4¢
Bar	4¼¢
Pipe	5¾¢, 20%
Tin Lined Pipe	16¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	6¾¢, 20%

Old Lead in exchange, 2¾¢ ℔ D.

Metal Exoanded—

Manufacturers' list No. 6.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1¼ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01½ @ .02½
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ lb..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft..... $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft..... $1.85
Roofing Pitch, ₩ bbl..... $2.26

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ lb.	₩ cub. foot.
Slag Wool, ordinary	1¼¢	15¢
Slag Wool, extra	4¼¢	38½¢
Rock Wool, ordinary	2¼¢	27¢
Rock Wool, extra	7¼¢	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.17@$1.18
Rosin, E. & F..... ₩ bbl. $1.30@$1.45
Rosin, G. & H..... ₩ bbl. $1.60@$1.90
Rosin, I. & K..... ₩ bbl. $2.25@$2.65
Rosin, M. & N..... ₩ bbl $3.10@$3.70

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50

Vermont:
Sea Green, ₩ sqr..... 2.7 @ 3.20
Purple, ₩ sqr..... 3.5@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ lb..... 4¢
Smaller quantities, ₩ lb..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8lbs., about 500 lb, ₩ lb..... 3½¢ } 5% dis.
½ bbls., about 300 lb, ₩ lb..... 4¢
Kegs, about 110 lb, ₩ lb..... 4¢
75¢ extra for keg.
Kegs, about 55 lb, ₩ lb..... 4¢ } 5% dis.

Yager's Soldering Salts.
½-lb bottles, each..... 30¢
Large quantities, per lb..... 40¢

Spelter—

Western Spelter..... 4¢@4½¢
Bertha (pure)..... 8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ lb..... 21½¢
Straits, pigs, ₩ lb..... 20½¢ @ 21¢
Straits in bars, ₩ lb..... 22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20..... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.00
Atlantic, IC, 14 x 20..... 5.75
Bonus, Extra Coated, IC, 14 x 20... 6.75
" IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
Dane, IC, 14 x 20..... 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28 ...12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Newcastle Real Old Method, IC, 14x20 9.50
" " " IX, 14x20 10.50
Newcastle Genuine Extra Coated, IC, 14x20 8.75
" " " IX, 14x20 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20..... 5.25
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.95
Venux, IC, 14 x 20..... 5.60
Vigilant, IC, 14 x 20..... 5.50
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20, 8.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 6.50
Iowa, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merlon, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" " IX, 14 x 20..... 8.50
Newcastle Best Coke, IC, 14 x 20..... 6.00
" " IX, 14 x 20..... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20..... $5.50
20 x 28..... 10.70
IX, 14 x 20..... 6.40
20 x 28..... 12.80
Abercarne Grade.—IC, 14 x 20..... 5.40
20 x 28..... 10 55
IX, 14 x 20..... 6.40
20 x 28..... 12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ lb.
Melyn and Calland Grade. IC, 10 x 14..... $6.50
" " IC, 12 x 12..... 6.75
" " IC, 14 x 20..... 6.50
" " IC, 20 x 28..... 13.00
" " IX, 10 x 14..... 8.25
" " IX, 12 x 12..... 8.50
" " IX, 14 x 20..... 8.25
" " IX, 20 x 28..... 17.00
" " DC, 12½ x 17..... 6.00
" " DX, 12½ x 17..... 8.00
Allaway Grade. IC, 10 x 14..... 5.75
" " IC, 12 x 12..... 6.00
" " IC, 14 x 20..... 5.75
" " IC, 20 x 28..... 11.50
" " IX, 10 x 14..... 7.00
" " IX, 12 x 12..... 7.25
" " IX, 14 x 20..... 7.00
" " IX, 20 x 28..... 14.00
" " DC, 12½ x 17..... 5 50
" " DX, 12½ x 17..... 6.75

Coke.
Steel Coke.—IC, 10x14, 14x20 $5.25@$5.35
10x20..... 8.12½
20x28..... 11.25
IX, 10x14, 14x20..... 6.60
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plate—

IXX, 14x26..(112 sheets)..... $13.35
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper..... net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz.... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 lb casks..... ₩ lb 5
Per lb..... 5½

It Is Reported—

That C. C. Schultz & Co. have succeeded the Hardware firm of Schultz, Gerber & Co., Bartlett, Ill.

That a certificate of incorporation has been issued to the Niswander Hardware Company, Parkersburg, W. Va. The authorized capital of the company is $100,000.

That Gilbert & Son, Hardware merchants, of Indianola, Iowa, have sold out their stock to a new firm, the style of which will be H. F. Schrader & Co.

That E. A. Rea has sold his Hardware stock at Leroy, Iowa, to Samuel Easton.

That William Eidam has purchased C. W. Marquardt's Hardware store, at Scribner, Neb.

That Charles Woods has bought the Hardware stock of W. Kerns, Ney, Ohio.

That Schaub & Swarm's Hardware store, at St. Elmo, Ill., was recently robbed of $250 worth of Cutlery.

That the Hardware establishment of Ketcham & Wilson, Plymouth, Ind., was destroyed by fire on the 4th inst. The building was a four story brick structure. The loss is $15,000, partially insured.

That L. H. Bissell has purchased the interest of Geo. E. Deming in the Hardware business of Hollinger & Deming, Chariton, Iowa.

That Newman & Kennedy's Hardware store, at Portland, Mich., was burglarized on the 31st ult.

That about $100 worth of goods were secured by burglars from the store of Charles E. Wolf Hardware Company, Altoona, Pa., on the 2d inst.

That Carter & Graves' Hardware store, at Puncell, I. T., was damaged by fire on the 4th inst. to the extent of $4000. The stock was partially insured.

That N. D. Johnson, dealer in Hardware, Lynn, Mass., has removed his stock to larger quarters, a change necessitated by his increasing business.

That Durkee & Son's Hardware store, at Grafton, Ohio, was entered by burglars on the 31st ult., who carried off a considerable quantity of the Cutlery stock.

That in a large fire at Montgomery, Mo., on the 6th inst., the Hardware store of Frank Sabourin was destroyed. Loss, $8000; insurance $6000.

That L. A. LeMieux has sold his interest in the Hardware business at Oconto, Wis., to his brother, E. A. LeMieux, who was his former partner. The transfer took place on February 1.

That the following officers were elected at the recent annual meeting of the stockholders of the Paddock-Hawley Iron Company, St. Louis, Mo.: Gaius Paddock, president; George E. Hawley, vice-president; Orville Paddock, superintendent; William M. Miller, treasurer, and C. T. Brace, secretary.

That L. B. Sullivan & Co. have succeeded Sullivan & Key in the Hardware business at Nevada, Mo.

That Peter Dethleffs has purchased the large Hardware and Implement store of Arney Bros. & Crawford, Manning, Iowa.

That the Hardware store of M. Knecht, Omaha, Neb., was entered by burglars on the 31st ult. The safe was opened and $125 in cash abstracted. About $10 worth of Pocket Knives were also taken.

That J. K. Mawhorter's Hardware store, Ligonier, Ind., was destroyed by fire on the 4th inst.

That the Hardware store of W. H. Smith, Richland, Iowa, was burglarized recently.

That William Huxford will engage in the Hardware business at Madison, S. D.

That Jonas Miller of Alliance, Ohio, has purchased an interest in the Hardware business of F. V. B. Minnich, Goshen, Ind.

That S. C. Welch, Hardware dealer, at Millville, Minn., has sold out.

That H. O. Monson & Co. have gone out of the Hardware business at Wheaton, Minn.

That Frank I. Williams, dealer in implements, Bedford, Iowa, has sold out.

That Sharpnack, Ferguson & Co., dealers in Hardware, &c., Modale, Iowa, have disposed of their business.

That Moore & Pugh, Hardware merchants, Redwood Falls, Minn., have dissolved partnership.

That A. R. Silverdale & Co. have succeeded A. N. Bates in the implement business at Marietta, Minn.

That I. M. Lyman, Hardware dealer, Concord, Neb., has sold out.

That F. H. Hudson and W. H. Carr have entered the Hardware business at Florence, N. C. The firm style will be Hudson & Carr. They will carry on a wholesale and retail business.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 3, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....812 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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The House Organ.

The publication of house organs appears to be on the increase. Manufacturers, and numerous merchants as well, are of the opinion that a fallow field lies invitingly in this direction, ready to yield rich returns if properly cultivated. A member of the firm or an employee with literary aspirations undertakes the preparation of a periodical, or mayhap an occasional publication, which furnishes information of more or less interest and value to those specially connected with their line of trade, and incidentally advertising the goods which they manufacture or handle. The publication is then mailed gratuitously to as complete a list as can be worked up of those whose trade it is desirable to secure. The plan is not new, as some long established concerns have from time immemorial published "circulars," "bulletins" or "journals" at stated intervals and distributed them to possible patrons. But while the idea is old, its greatest development has been quite recently, so that it almost appears to be new.

Worthy and Worthless Papers.

Matters are fast getting into such shape now that a manufacturing or mercantile establishment will not be considered completely equipped for business unless it can boast of its own organ with its well organized publication department and very complete editorial corps. Some of these periodicals are of a really high order. They are beautifully printed, magnificently illustrated, and contain very instructive articles in their special line. They would be exceedingly creditable as independent publications, and are worthy of an existence. In fact, publications of this class are so well appreciated that their circulation lists are in danger of becoming unwieldy, and in some instances a subscription fee is exacted, which will, of course, only be paid by those to whom the publication is of genuine value. There are others, however, which have no special merit. They are mere advertising circulars, giving no interesting news, no original information, no results of tests or investigations, but are only devoted to puffing the house which stands sponsor for the publication. Yet money is thrown away in bringing them out regularly, in the hope that some trade may be influenced. This is, perhaps, the case, for printers' ink must be credited with a great deal of power. Even circulars are glanced at before they are thrown into waste baskets, and some of them have been known to lead to rather important results.

The Value of Trade Papers.

We do not share in the apprehension felt in some quarters that these house organs are destined eventually to supersede trade papers. The trade press has its legitimate function, which such private publications can by no means fill. In nearly every case the latter only cover a narrow field and rarely attain special distinction. The crop of fresh ideas is apt to run out, and the ambitious journalistic amateur who starts out to make an indelible impression on his customers finds that fresh talent must be won to his assistance if he would keep his venture from traveling in a rut. The house organ will have its day, like other experiments, and while the fever runs will be beneficial to printers and paper manufacturers. If the number of such publications could be limited to, say, one or two concerns in each particular line, the enterprising publishers would very probably reap advantages. But when this method of advertising becomes common there is nothing in it for any one in particular, and the practice of issuing such publications merely becomes a heavy tax. It appears to us most unwise to depend exclusively on such a scheme of advertising and to abandon, even temporarily, the trade journals which are recognized leaders in their lines.

Trouble in the Building Trade.

The carpenters of the country have not abandoned the effort to establish a general eight-hour day. District conventions were held throughout the country on the 22d ult., to continue the agitation of this question. One of the most important of these meetings was held in Chicago, delegates being present from a number of large cities in Illinois, Indiana, Iowa, Wisconsin and Michigan. A series of resolutions was adopted to the effect that it was the sense of the convention that the time had arrived when an eight-hour day was necessary to furnish employment for the greatly increased number of men seeking work, and also to furnish more time to workingmen for recreation and self improvement. April 1 was the date set to make a universal move to secure such a result. The hours of work were established from 8 till 5 o'clock, with an hour intermission in the middle of the day. All overtime, including Sundays and holidays, is to be counted as time and a half, and only allowable when the work is in immediate danger. As it is the evident intention of the leaders in this movement to force the payment of ten-hour wages for an eight-hour day, the prospect favors a bitter struggle between employers and workmen in the spring. This is unfortunate, because building projects had latterly become encouragingly numerous, and business in related lines promised to be greatly benefited. Instead of employment being secured for more men in the building trades, as set forth in the resolutions, this action may lead to the employment of but few. This would be most deplorable.

Steam Vessels on the Lakes.

Eight of the 20 customs districts in the United States in which the ownership of vessel tonnage on June 30, 1893, exceeded 50,000 tons were on the Great Lakes. New York is the only district in the country that exceeds Cleveland in steam tonnage, while the amount of steam tonnage owned in Buffalo is greater than in any district excepting those named and San Francisco. The NewYork district owns 1134 steam vessels, having a total tonnage of 441,265, while the Cleveland district owns 177 steam vessels having an aggregate tonnage of 183,346. Cleveland, with less than one-sixth the number of steam vessels, has more than one third the tonnage of New York. The total tonnage of sail, steam and canal boats of the principal districts of the Lakes is as follows: Cleveland, 241,093; Buffalo, 172,316; Port Huron, 169,137; Detroit, 160,165; Milwaukee, 95,743; Chicago, 90,530. The annual reports from the office of the Commissioner of Navigation prove that the Lakes are steadily gaining on other sections of the country in ownership of steam vessels. As specimens of marine architecture, the boats built on the Lakes are only exceeded by the Atlantic liners in the matter of size; in regard to design, equipment and workmanship there is but little choice between the two classes.

THE LETTER BOX.

The Sum of Small Savings.

From OBERLIN SMITH, *Bridgeton, N. J.*—Referring to your editorial "A Remarkable Economy," in *The Metal Worker* of January 27, I will say that I have for years past been familiar with many of the manufacturing methods of the company referred to, having made double shearing machines for trimming off the edges of the tin plate sheets in question, and having, later on, found certain schemes for utilizing the strips of surplus metal trimmed off, in reducing the sheets to size, entirely frustrated by the very sensible economy you speak of, where the plates were ordered at the factories abroad with but a very narrow margin for trimming. It may be of interest to your readers to make mention of a still more remarkable economy which is practiced in the making of these same cans, which, by the way, are of 5 gallons capacity and measure about 9½ inches square by 13¾ inches high. This saving was made in the amount of solder used for fastening the heads to the bodies and amounted to over 66 per cent., although the form of the seam and the strength of the joint were not at all changed. The seam in question is made by inserting the body in a groove formed around the edge of the head, the flange of the head outside of the groove standing up but little over ⅛ inch. The joint is then squeezed so as to throw this flange inward somewhat and the end of the body outward, thus making a dovetail fit, so to speak. This joint is somewhat strengthened by the friction of the parts, as the groove formed in the head is tightly squeezed upon the body; but in the nature of the case it cannot be very strong until after soldering, not being at all of the type known as a "double seam." The soldering was formerly done by holding the can at an angle of about 45° with the vertical, and dipping each of the eight edges forming the peripheries of the two heads in a shallow bath of melted solder, the flux having been previously applied to the metal before squeezing it together. Certain experiments showed that if the end of the body could be squeezed tighter in the groove of the head, so as to leave less room for solder between the four surfaces involved, considerably less solder would be used, and a machine was, therefore, developed for pressing the three thicknesses of metal closer together by a process known as roller squeezing, both ends of the can being done at once and the whole operation taking but a very few seconds. This, as was afterwards proved, saved about one-third of the solder, while making an equally good joint. Later experiments showed that if the can was lowered quickly into the solder and then lifted slowly out, with the seam somewhat inclined to the horizontal as it left the surface of the bath, so that the solder would drain toward the corner leaving the bath last, considerably less solder would adhere uselessly to the outside of the can. By carrying this principle out upon the four lower edges of the can in succession, inclining the seam the first three times in the same direction, so that the solder would flow from previous seams toward the one last dipped, and then inclining the fourth in the opposite direction, so that its drainage would be toward the same corner at which all the surplus solder had so far accumulated, and then by giving a fifth dip with the can in a diagonal direction, so that the corner in question struck the bath as an inverted pyramid, a drop of surplus solder was picked off, so to speak—by its being somewhat remelted and by its adhesion to the solder in the bath.

At a later period the five somewhat peculiar motions above mentioned were incorporated in an automatic machine, invented jointly by Mr. G. H. Perkins and myself. This machine carried two cans at a time, which could be placed in position by the right and left hands respectively of the attendant, who, while the dipping was being performed, could attend other machines alternately. This machine, of course, revolved the cans to exactly the proper angles, gave them proper speeds of entrance and exit, and finally knocked them out upon a table placed in front. The attendant replaced them the other end down, and the second time removed them out of the way. This process, as it proved, saved another third of the original amount of solder consumed, although apparently imitating the operation of hand dipping formerly practiced. Its success was, of course, due to its ability to give exactly the right motions and to its maintaining absolute uniformity in its action, as well as to its picking off the superfluous drop. Furthermore, a cheaper class of labor could be used and a larger production per operator be attained. I do not know exactly the amount of money that is being saved by the use of these machines, nearly 100 of which are running in various parts of the country, and such information as I have I do not, of course, feel at liberty to make public. The general mention of the system used is obviously perfectly legitimate, as full details of the squeezing and dipping machines in question have already been made public through the Patent Office. The moral of my tale is, of course, the pointing out of the enormous aggregate economy sometimes attained by careful attention to very small details, in cases where it happens that such details may be multiplied by a quantity consisting of indefinite millions. In other words, a multiplicand may be a very incousequent affair if the multiplier is only big enough. In this case the resulting product, made up from "little drops of solder, little dimes of pay" (to paraphraze the Sunday school song), is something which would, in the form of an income, make either the editor or me feel exceedingly happy.

Cold Water from Boiler.

From D. H. S., *Watkins N. Y.*—Noticing the reply to "H. & J.," of Pennsylvania, in *The Metal Worker*, February 24, allow me to say that running the hot water pipe down from the boiler will not interfere with the flow, if there is no connection between the flow pipe and the circulating pipe. The connection shown in the diagram is the primary cause of the trouble and the water flows as explained. The circulating pipe must be kept separate from all other pipes. There are four openings in every boiler, and the hot water pipe must always start from the top to get the hottest water.

Expansion of Metals.

From T. H. L., *Syracuse, N. Y.*—Please inform me through the columns of *The Metal Worker* what known metal, or combination of metals, will expand to the greatest extent when in contact with hot air or steam, and what would be the length of a heated rod of the same that was 12 inches long and ¼ inch in diameter when cold?

Answer.—Our correspondent has used the words hot and cold rather indefinitely, and we must assume certain definite temperatures from his steam and hot air if we are going to tell what the expansion of metals will be between the minimum and maximum. Metals expand regularly for each degree of heat, and we will, therefore, assume that the metal expands from freezing to boiling—that is, from 32° to 212° F. We have not at hand an exhaustive table of metals and alloys with regard to their expansibility, but among all ordinary metals the one of greatest expansion is zinc. Between 32° and 212° forged zinc expands one three hundred and twenty-first part of its length, or 0.374 inches in 10 feet. Our correspondent asked what would be the length of a certain bar of which he adds the diameter. The thickness of the metal, however, has nothing to do with the lineal expansion. It will be the same whether it was ¼ inch through or 10 feet through. A bar of forged zinc which was 12 inches long at 32° F. would be approximately 12 1/321 inches at 212°.

Difficulty With Drive Well.

From H. W. H., *Lynn, Mass.*—If "W. M.," of Little Falls, N. J., who reports trouble with his pump and well in *The Metal Worker*, February 17, used the point and strainer usually for sale at the supply stores he may find the trouble at the bottom of the well. I have experienced the same trouble, and upon looking for the cause discovered that in many cases the combined area of the holes in the strainer was not more than 60 per cent. of that of the pipe. By their being made so small, the gravel or sand more easily stops them up, thus reducing the supply of water to the pipe and pump, causing the pump to "kick back," as our men call it, even in places where the supply was ample and the lift less than 10 feet. I now have my strainers made

by drilling about 2 feet of the lower end of the well pipe full of $\frac{3}{16}$ to $\frac{5}{16}$ holes, usually about 80 for 1¼ inch wells, and find them both cheaper and more satisfactory. If troubled by sand in quantities that injure the valves of the pump, I place a Smith or other sand chamber under the pump.

From T. A. B., *Herkimer, N. Y.*—In regard to the trouble of "M. W," in *The Metal Worker*, February 17, with drive well, I would advise him to place the cylinder about 8 feet below the surface. Then use a common pitcher pump with rod the proper length attached to the plunger. If in clay soil this same trouble will occur, making it necessary to redrive.

Corrosion From Ice Drip.

From S. A. S., *New York*—We were called upon about a year and a half ago to reline with galvanized iron a box used as a drip catch to a very large ice box. We found the old lining good except in spots where the drip struck the box. We took the lining out, which was No. 28 galvanized iron, and substituted No. 24 galvanized, and in three months time this also was gone in the same spots. We then lined it with sheet lead, 4 pounds to the square foot, and in one year this also was in holes in the same spots. Please inform us of the cause and if sheet copper would be better than the above mentioned materials for this purpose.

Note.—It is possible that the trouble complained of is due to the fact that the dripping water carries away the protecting coating of oxide or carbonate of the metal that forms on the surface and so permits speedy corrosion. Where lead, for instance, is exposed to the atmosphere it will endure for an indefinite period, as the surface becomes coated with a carbonate which is practically insoluble, and prevents the air from getting at the lead itself. Where a drip of water takes place, however, it would be apt to carry off any soft coating by mechanical action, and it is possible that apart from corrosion the mere wearing action of the water is an explanation of the rapid destruction of the metal. We think that copper would prove a more enduring metal than either of the others in this case. If the trouble is due to the drops striking the metal, we would suggest that a remedy would be to put a piece of board above the lining where the dripping strikes so that the water hitting on a wooden surface will spray or run down on the metal.

Left Handed Tinners.

From JOHN S. BROOKS, *Brooklyn, N. Y.*—In reply to "Right Hand," in *The Metal Worker* of February 24, I can tell of my experience with a left handed boy and can see no good reason why it may not apply to another if he has the right instruction and perseverance. In 1852 I took an apprentice at Rochester named L. B. Grover, who is now dead, who was known as a good workman. When I found he was left handed I told his father I could not keep him and wished the papers canceled; but his father told me to keep him and that I need not pay him any wages and could charge him with any work spoiled or other loss. I consented to that and started the boy on a large lot of milk skimmers, insisting that he should hold the hammer for punching the holes and for raising them on the block in his right hand. The boy did it, having the stuff in him for a good workman, and the change to the use of the right hand never gave him or me any perceptible trouble. After he had worked a short time the necessity of using his right hand overcame the habit and even proved a benefit; and as I allowed him to use his left hand for a rest to the other, it ended in his being just as apt with one as with the other. At the end of his first year his father wanted him for his shoe store and offered me $100 to give up the contract, which I did, reluctantly, thinking it was for the boy's best interests. He had been in his father's store but a short time before he was competent to take measures, and became a skillful cutter, using either hand with the knife, and afterwards, by the changes of business fortune, went back to his first trade with success. This long story is more than an answer to "Right Hand," for it teaches a lesson to other boys that they must not get the idea that they can become good workmen without using all of their energy, and when they meet obstacles to surmount them by persistent determination. It also teaches employers to use discretion in selecting boys, and that a left handed one with brains is better than a right handed idiot.

From A. C. R., *Mt. Vernon, N. Y.*—In reply to "Right Hand," whose letter appears in *The Metal Worker* of February 24, I do not think his experience with left handed tinners can be taken very seriously. I, myself, am left handed, so much so that I do everything with it with the exception of one thing, and that is blessing myself. I have worked in a shop where there were four left handed tinners employed, and all good mechanics; but still, in all my 12 years' experience, I have never had to have any left handed tools made to order for my use.

Self Registering Thermometer.

From S. C., *Marshall, Texas.*—I would like to be informed in regard to an instrument I have seen for showing the temperature in which the mercury rises in a glass tube during cold weather instead of lowering as in the ordinary thermometer.

Answer.—Our correspondent has in mind one form of what is known as a self registering thermometer. This construction has indexes in the tube which stick at the highest and lowest temperatures, so as to give a permament record of the greatest degree of heat or cold. In the one that he presumably has in mind the thermometer consists of a long tubular bulb united to a smaller tube more than twice its length and bent twice like a syphon, so that the largest tube is in the center, while the smaller one terminates at the top in a bulb. This bulb and the tube connecting with it are partly filled with spirit, while the long central bulb and its connecting tube are completely filled with spirit and the lower portion of the syphon filled with mercury. As the temperature rises the long bulb expands and forces the mercury up in the column connecting with the partly filled bulb. As the temperature falls the spirit contracts in the central tube and the mercury follows it and consequently rises in the tube. The mercury in this case is nothing but an index, and the temperature is in reality indicated by the expansion and contraction of the spirit in the bulb.

What Caused the Collapse.

From F. M. P., *Cobleskill, N. Y.*—I write in answer to the question in *The Metal Worker*, February 10, "What Caused the Collapse?" The water was forced out of the boiler back into the tank in the attic by steam generated in the water front, and as the water went out the vacant space was filled with this steam. Now, there are two ways in which this steam could suddenly be condensed. The first is by opening a hot water faucet and thus relieving the steam pressure, and the other is by the water being forced out down to end of the tube and allowing the steam to pass up through the tube and supply pipe, thus relieving the pressure. In either case, after the steam pressure was removed the cold water began to flow back into the boiler through the tube, and this tube, which is now surrounded by steam, is chilled by the cold water passing through it, and causes the steam to condense very suddenly, leaving the boiler empty of either steam or water, rendering collapse inevitable. The first of these conditions probably obtained, as your correspondent says hot water had been drawn but a short time before the collapse occurred. The statement that the boiler was full of water when it collapsed, I do not believe. It might have been full up to the point where it "caved in," thus allowing the water to "spurt out of the hole made by the collapse," all pressure now being removed and the water flowing in from the tank. The remedy for this is the relief pipe, which must be connected with the hot water pipe, and carried up to and over the top of the tank, with end always above high water mark. The vacuum valve will not do, as it cannot possibly prevent the water being forced out of the boiler, and the consequent discoloring of the boiler by the hot steam. It might, however, prevent collapse, yet this is not certain when so large a vacuum is formed so suddenly.

Refrigerine.

From HANTZ & JESSOP, *York, Pa*—Could you give us any information in regard to a refrigerator using a composition called "refrigerine" instead of ice? We think that it is manufactured in Pittsburgh.

Note.—We have had inquiries made in Pittsburgh for the article mentioned by our correspondents, but fail to find any trace of it in that city. If any of our correspondents can supply the information we shall be glad to have them do so.

Roofing Fire Pots.

From F. W. S., *Bayfield, Wis.*—As this is a slack time for most tinners, I would like some of the boys to send to *The Metal Worker* drawings of a good roofing fire pot for charcoal, one got up exclusively for roofing.

Management of Men and Workshops.

Developing Skill.—Does it Pay?

BY THOS. D. WEST.

Few factors, injurious alike to the interest of employer and employees, can be cited than the lack of skill many men display in the manipulation of manufacture. Work requires more or less brain power in all industries. The more study and experience can develop skill the more valuable become the services and time of the workman.

When by investigation we find that there are but few industries that do not suffer for the want of good skilled employees, and that instead of progressing they are degenerating, it is very evident that a universal movement inaugurated among manufacturers to educate and develop skill would be as beneficial to the employee as the employer.

The work of man in the pursuit and maintenance of civilized life may be distinguished as that of the professional or the artisan. In obtaining education and skill to follow either, a course of schooling or training is necessary. While the former is taught in the college, the other is obtained in the factory or workshop. The ability and knowledge acquired upon entering life as a professional man or as an artisan depends upon the length of time given up to college discipline or trade apprenticeship. While in the artistic or professional pursuits the demands are constantly growing more exacting, with the artisans or tradesmen the reverse is the practice permitted to-day. The discussion of the causes is not the aim of this paper. Suffice it to say that the standard of ability and skill in many of the trades is lowering, for the old school of mechanics and good workmen are fast passing away.

The professional man is going up and the mechanic is going down. They are pulling apart from each other at an alarming rate, to the injury of all concerned. It surely is as essential for the mechanic to be a master of his calling as it is for the professional man to be of his. Probably it is the greater intelligence of the latter which accounts for the quicker appreciation of the advantages to be derived by the possession of knowledge and skill.

The fact that professional men, by often giving 25 years of early life to study or learning a profession, can often accumulate sufficient in ten years to make them independently wealthy, should cause artisans or mechanics to perceive that high wages should not be expected without a return of equivalent in ability for the wages received. If our most intelligent citizens recognize and follow the practice of giving up years of early life to study ere expecting recompense in after years, there must be some good reason for it. It is about time that the artisan commenced to connect cause and effect and make an effort to retard the too often downward course of artisans' skill. The employers should bring facts to the front to prove to their employees that it pays to expend sufficient time and energy in early life to become thoroughly proficient in a trade or occupation in order that middle life may be so remunerative as to make their last years yield to them independence.

I cannot but think that if this matter were rightly presented and taken hold of by employers, a great influence could be brought to bear on youths or beginners.

The lack of skill exhibited to-day in many of our industries is wholly due to the haste of beginners to receive what they call "man's wages." I think it safe to say that this predominates and is tolerated in America much more than in Europe. We find foreign tradesmen much more proficient in many of our callings than those schooled in America, because their apprenticeship years are more numerous than ours. In this country apprenticeship lasts from one month up to three years. The indifference which manufacturers seem to exhibit to this condition of affairs is not only injurious to themselves but to the workmen or employees, for the great majority never start young enough or stay long enough as apprentices at any trade to become sufficiently skilled to give an equivalent for good wages.

Just as quick as many can obtain an elementary knowledge of a trade, they go off to bluff their way through life, and as there is but little else on the market or running loose for hire, a firm generally must engage them. All through their engagement it is nothing but bickering, discontentment and strife to get out good work without loss of time and stock. As a general thing the unskilled employee is constantly asking for more money and raising a disturbance in general, for it is very seldom that one can find a "poor tool" capable of minding his own business or being satisfied with anything near the equivalent he gives for wages. Generally he thinks himself as good as the most proficient employee; such is characteristic of "poor tools." One is always safe in figuring for losses, contention and worry when they are about, but thanks to the occasional dull periods in business, the "poor tool's" services can then be dispensed with. The employer can then take a little pleasure in life or feel his soul is his own, while the "poor tool" becomes a tramp, seeking whom he can next worry and impose upon. But after all it becomes a question who is to be most sympathized with. Surely the "poor tool" ere he is "fired" many times and sees others retained in his place must commence to realize his mistake in not having given more time to perfecting himself in youth at his trade or calling.

This brings us back again to the question of haste exhibited by youth to enter manhood for the duties of life ere he is equipped sufficiently with knowledge and experience to make the fight. Thirty to fifty years back a youth never thought of anything other than serving five to seven years learning a trade, if it was at all worthy such a name, and not only was he generally "bound" to give such time, but in some cases we are told that in Europe he was liable to imprisonment should he attempt to run away. Instead of his receiving money, in many instances payment would be demanded from him in consideration of obtaining the privilege to secure a chance to learn a trade. In those days boys were not men, and they well knew that if they would attempt to assert independence before they had acquired knowledge to entitle them to having man's diplomas (experience and ability) they would receive such a set back that it would cause them to think there was much in the maxim, "He grew to the size of a man but had the brains of a goose." "The laborer is worthy of his hire" is far from the justice of enactment that existed in past years, for then the laborer himself figured upon giving an equivalent for every cent he received. To-day it is more figuring to "get in time."

There is not a sufficient number of skilled men for the work this world demands, and the "poor tools" by combination are not always going to be able to depress or hold down those of ability or skill. The attractions of this age over those of the past for labor are such that they should induce men to exert themselves to become skilled workmen, so as to receive the higher wages. It requires but little effort on the part of those who believe and realize that it is but just that experience and ability should be rewarded, to start the artisan in the direction of acquiring more proficiency in his calling. Of course, "poor tools" may improve themselves in some lines most every day, but at what a cost to the employer! Even then it generally would take ten years experience to gain the knowledge which could be obtained in one year through the proper apprenticeship, for two reasons: 1, that a young person grasps ideas, learns quicker and maintains knowledge longer than if obtained when an adult. 2, the simple matter of his being an apprentice implies that he is under instructions and has teachers who should give him attention and the value of their experience. An intelligent teacher can express in four or five words what he has learnt through years of practice.

You cannot as easily make skilled employees out of men as you can out of boys. I well know that many excuses are offered for the degeneration of skill. A good many cry, we don't have the opportunity, too much of specialty business going on. Isolate, fence them off, consider specialty shops as of another realm, and yet with present condititions it would be about the same old song, "I do wish I could hire a few good, experienced, skilled men; they are getting worse and worse every day."

It is not going to remedy matters to ignore the truth and set up a visionary ghost to scare us from the road which could lead us onward to improvement. If we want to create or make good, skilled employees, there should be more opportunities to-day than in the past. We can obtain to-day good and thorough information to understand the principles of nearly every trade. We need not simply practice imitating, as had to be done ten years back or further. We need not "go it blind" or be guided by "rule of thumb." We can know what should be done to meet with success. The old school had not the knowledge of science and principles nor the advantages which the workman can obtain to-day. What is most required at the present time is to have the apprentice attach more value to obtaining the privilege to fully or thoroughly learn a trade and less to the question of wages. He will then find that there are just as good opportunities for learning a trade now as in the times of the old school.

Through the costly teaching of experiment and experience the old school simply knew that work had to be done in a certain manner. Why? was a question very few, if any, were able to answer. Give us our old school of "bound apprenticeship" combined with our advanced knowledge of the principles and science of our trades and the best old school mechanics or skilled men could easily be surpassed by the new school in giving an equivalent for high wages.

But many employers are not clamoring at present for an improvement over

the old mechanics. Many of them would be well satisfied with men equal to the old mechanics. To obtain them we must turn back and pick up the diacipline that made skilled men out of boys many years back. What was that? I can surmise being asked by youth. It waa not a course, my young American buck, that, with your high strung notions, is expected to receive favor in your mind. But as you have asked the question I will tell you, and by putting the introduction in the shape of a "wild West" story, you may be interested sufficiently to follow me into starting into a solution of the problem.

Your first move is, of course, to hunt for an opening that will suit your inclination and talents; and before getting on the trail of it you will often meet many disappointments. Still, the experience you will receive will cause you to only appreciate the prize the more when obtained. Your adventures may lead you far from friends and home, but to atrive for honors you find accorded to the famed experienced old heads you must be willing to undergo any and all forms of sacrifice and hardship if only at the end you can come out a thoroughbred. Now to reach that in a trade is not achieved in a month, or in a year or two. In many occupations it requires from five to aeven years at low wages and endurance of hardships.

Now we wait your answer. Do you want to atart in? You will be left some privilege; you can kick once in a while, but if too many off goes your head, for remember there was no fooling or wasting time with boys having the "big head" when the rule of the old school was in force. Then you were not considered a man until you had obtained a fair amount of knowledge and good common aense. If you started at 14, at 21 you should possess it and enter manhood with aufficient knowledge and akill in your trade to command and give an equivalent in work for good wages. You would do as well starting with six years of apprenticeship at an average of only $6 per week, and following that with your first four years' wages as a journeyman or skilled artisan, averaging $18 per week, as you would had you served three years at $8 per week and the first seven years as a journeyman at $12 per week. The latter is large wages for the majority of "poor tools" that are turned out these daya in many trades. Figures will now show that in ten years the amount of money received is exactly the same in both cases. Now, before going further, I would ask if you can discover what could be deduced from the above. You hesitate; well it is simply this: That every day you now continue to work at the trade you average $1 per day more for your labor than if you had only served a three years' apprenticeship. Do you fully realize what this means? No? I thought so. It is just the way you have realized everything else that is best for your own interest. Well, as your past has proved how purblind you are to see any further ahead than your nose, I suppose we will have to knock it into you, and to do so we will suggest or allow you a life of 30 yeara more as a journeyman.

	Three-year aporenticeship.	Six-year apprenticeship.
Weeks in a year..	52	52
Wages per week.	$8.00	$6.00
Wages per year.	$416.00	$312.00
Years apprenticeship.	3	6
Total apprenticeship wages.	$1,248.00	$1,872.00

	Seven years journeymanship.	Four years journeymanship.
Weeks in a year.	52	52
One week's wages.	$12.00	$18.00
One year's wages.	$624 00	$936.00
Journeyman years.	7	4
Journeyman wages.	$4.368.00	$3,744.00
Apprenticeship wages.	1,248.00	1,872.00
Ten years' wages.	$5,616.00	$5,616.00
Thirty years' journeymanship.		
$3.00 per day		$28,080.00
2.00 per day		18,720.00
Bonus for ability and skill		$9,360.00

Having reached this point you cannot but perceive how dearly you have paid for thia "big head" privilege of which you thought so much while serving an apprenticeship of three months to three yeara. Here you aee just that because you could not deny yourself a little pleasure and independence in the firat years of your life you have sacrificed virtually $10,000, a young fortune actually thrown away.

You lost an opportunity of being "aomebody" who would be sought after, and by your akill be assured of steady work; inatead you go into the world as a "poor tool" to be knocked from pillar to poat; you will be more than likely to be half your time out of employment and the other half be an object for censure and abuse.

Youth is the schooling time of life. A rebuff is aimply given as a reprimand to awaken boya to make an effort to do better, but during manhood years rebukes are a slur on ability or akill, and in many cases lead to discharge.

It is best that they be received in youth, when forgotten in five minutes, while in manhood years they will ever be remembered and redound to their discredit and debar them from many of the comforts and pleasures they might have taken in the companionship of man, duties and responsibilities of life.

There is one element in the figures here presented which by a close reader may be called into question, and that is that one apprentice should average $8 per week for three years, while another ahould average only $6 per week for six years. Since a modern apprentice and hia backers insist on his receiving large wages, the employer, in order to not lose by the contract, gets the apprentice perfected in doing one thing just as quick aa he can. At that he keeps him just as long as he can, so as to get an equivalent in work out of him for the large apprentice wages he insists on receiving. Then, again, the proprietor, having no "bond" or guarantee that an apprentice will stay any more than a day or a month, often finds it necessary to get all out of the apprentice that is possible while he may remain. If he only knew that the apprentice was to atay a definite long time it would, generally speaking, be to the employer's interest to start him in at the bottom and gradually work him up to the top, with practice in every line of his work. If the employee will only reason this out he cannot but perceive the common sense of such a position. This may be "letting a cat out of the bad," but the secret is now divulged and it should be a pointer to not be too exacting in the question of wages, but to try to get a chance at more than one thing in a firm's manufacture. In fact, endeavor to secure a chance at learning and having practice in all that may pertain to the trade or calling. This working or having experience at only one or two things in a trade is what "floods our lands" with "poor tools," and causes many to have a smattering of several trades. They master none because they float from one to another trade in the hope of bettering themselves.

Let a chance to thoroughly learn all there is in a business be our first consideration, and the question of wages come second, as was the practice of the old school. In the end it does pay to develop ability, and now more than ever should the employer and employee labor to develop the much required skill, for in this question their interests or welfare are at least mutual.

One of the results of the International Congress of Education in Chicago last summer is the organization of the Manual Training Teachers' Association of America, to secure the development of manual training in the educational aystem of the United States. At a meeting held in Cincinnati last week the association waa formally organized, the plan and scope of the association were considered and a constitution waa adopted. The officers of the association — Geo. B. Kilton, Springfield, Mass., president; Geo. S. Waite, Toledo, vice-president, and Geo. Robbins, Frankfort, Ky., secretary and treasurer—constitute the Executive Committee, which is now making arrangements for a aummer meeting.

Secretary Carter of the Maryland Board of Health has compiled the following statistics showing the mortality in various cities of the United States and Europe having a population of more than 100,000:

	Population.	Deaths.	Death rate per 1,000.
London	5,849,101	55,895	19.11
Paris	2,424,705	28,675	23 61
New York	1,801,739	23,856	26.47
Berlin	1,669,124	17,181	20.58
Chicago	1,458,000	13,590	18.95
Vienna	1,435,931	18,005	25 07
Philadelphia	1,115,562	12,249	21.95
Brooklyn	978,394	10,685	21.84
St. Louis	520,000	4,802	18.47
Brussels	488,188	4,359	17.86
Boston	487,397	5,816	23.88
Baltimore	455,427	4,806	21.10
Dublin	349,594	4,735	27.05
San Francisco	330,000	3,006	18.21
Cincinnati	305,000	3,000	19,67
Cleveland	290,000	2,538	18.19
Buffalo	290,000	2,361	16.28
Pittsburgh	255,000	2,923	22.92
New Orleans	254,000	3,598	28.72
Edinburgh	267,000	2,572	19.22
Milwaukee	250,000	2,000	16.00
Louisville	227,000	1,630	14.80
Minneapolis	209,000	1,004	9 60
St. Paul	155,000	745	9.61
Christiania, Norway	156,500	1,385	17.75
Denver, Col	150,000	871	11.61
Rochester, N. Y	144,834	1,291	17.87
Reims, France	105,498	1,503	28.62

A Brooklyn, N. Y., firm of coal dealers have instituted a sensible and cleanly method of delivering coal to householders in bags. This new departure is much appreciated, as being a decided improvement over the old dirty and inconvenient practice of dumping the coal on the sidewalk and shoveling it from thence into the cellar or coal bin. Delivery of coal in bags prevails almost generally on the other side of the water.

The city of Trenton, N. J., is suffering severely from the suspension of her pottery industries. Twenty potteries are closed down, as well as a number of brick and decorating yards. Fully one-half of the city's working population is reported as idle, and much distress prevails, 1000 entire families being fed and supported by the Citizens' Relief Committee.

STEAM AND HOT WATER.

Warming and Ventilation.*—II.

(Concluded from The Metal Worker February 17.)

The Plenum System and its Modifications.

The whole of the fresh air is taken at one central place, where it is also filtered and warmed, and is then propelled by a fan into the rooms, out of which it forces the whole body of vitiated air. Each room has its separate polluted air flue, which leads upward, and allows the foul air to be discharged into the open air. The heating is done by low pressure steam.

In the case of the Melbourne Road Board School, Leicester, the fresh air is admitted through a shaft 12 feet from the ground and 26 superficial feet, at the bottom of which a coarse filter of jute cloth is fixed. The latter may be fitted with a water supply, so as to still further arrest the floating impurities in the incoming air, and wash the jute screen. Through this the air is drawn by the open bladed fan driven by a 5 horse-power gas engine, which latter is really larger than necessary, but has given very good and economical results. The fan is 5 feet in diameter, and is run during the cold weather at 250 and during the warm weather at 325 revolutions per minute. It propels the air forward into the large underground trunk, which forms a circuit under the school.

This main duct is 5 feet wide by 6 feet 6 inches high, its bottom is formed of concrete faced with cement, its sides of good brick work and the top is covered with concrete slabs; it is kept spotlessly clean and the sides are whitewashed from time to time. It will be noticed that the extra constructional work is not great in this case, the inner wall only having to be built, the outer wall being taken down a little deeper than would have been the case without such a system.

In this main duct and at the bottom of the several upcast shafts are placed the heating batteries and coils, which are supplied with steam from a Cornish boiler fixed in a sub-basement so as to allow the condensed water to return to it by gravitation. As there is no water wasted in this arrangement, it is seldom replenished in the boiler—say once a month. As there is so little fresh water used in the boiler, no deposit to speak of is formed, hence there is no trouble in cleaning out the boiler.

The boiler is of the Cornish type and is usually worked at a pressure of 5 pounds per square inch; sometimes, however, it has happened that the gauge indicated no pressure at all and yet the batteries and coils were warm. The steam service works absolutely noiselessly, and there have been no broken or leaky joints since the apparatus was set to work. The steam main is run right round the underground trunk and great care is taken in the laying of it, the pipe being anchored at each end, whereas in the middle special compensators are fixed to allow for the expansion and contraction. At every rise in the main pipe a special fitting is fixed, called a "fixed point," which is dripped; this drip pipe communicates direct with the return, which is run at the bottom of the duct and is connected with the boiler just below the water line. A great deal might be said about the proper laying of steam pipes, but time will not permit of it here.

All the class rooms are heated by these batteries, which are placed, as already stated, in the main underground duct, but the large halls are heated by direct radiators, which are fixed on the respective floors in such a position that the partially warmed air of the trunk enters the room through gratings under them. In these large halls, where the number of children taught is small in proportion to its size, this plan of keeping them warm has been found more economical than if they were heated from batteries in the basement; it also admits of these rooms being warmed independently of the fan, which is an advantage at times, and has the desirable effect of warming the walls. The staircases, corridors, lavatories and cloak rooms are also heated by direct radiators.

The inlets for the fresh air are fixed about 8 feet above floor level in all class rooms, and there are two sets of outlets provided on the same side for the vitiated air, so that it can be either forced out near the bottom or near the top of the room. From experiments and from actual work it was found that the best results were obtained when the vitiated air was taken off near floor level, which cannot be surprising when the amount of dirt and dust which every day collects on the floor of a board school is borne in mind. This, together with the emanations from the skin and lungs of the children, are not allowed to rise and pollute the air, but are removed before they can do harm.

The action of the incoming air is rapidly upward and across the room, spreading itself out as it passes toward the outer walls and windows, thence flowing down their cooler surfaces to the floor and rising slightly again, it eddies across the room in waves to the outlet grating, through which it is forced out. By this method all the air entering is made to circulate throughout the room before it reaches the exhaust shaft, and there is a constant movement and mixing of the air going on in all parts of the room.

The temperature of the rooms is kept at about 60° F., and there has been no difficulty whatever in obtaining this temperature in a single room by 9 o'clock in the morning, even on the coldest day. In most schools the caretaker has to be at his boiler by 5 30 or 6 o'clock, but in this case he does not attend to it before 7 a.m. If the temperature in a class room requires altering the head master telephones down to the caretaker, who raises or lowers it according to requirements without altering the volume of air supplied and without interfering with the temperature in any other room.

The number of children at the Melbourne Road Board School is 1700, the consumption of coal ½ ton a day, and the cost of gas, oil, waste, &c., about 6 shillings per week.

The success of any installation of the plenum system depends, in the first instance, on the manner it has been designed and carried out, and in the second, on the way it is worked and maintained from year to year, and a few remarks on some points of importance in designing and carrying out large schemes may not be out of place.

1. As to ducts and flues: All the ducts and flues must be large enough for the quantity of air they have to pass at a moderate velocity, and must be so constructed that they can be kept perfectly clean in every part without any difficulty, and limewashed for disinfecting purposes should this be required. The main duct should be large enough to admit a man comfortably, and all vertical flues should rise directly from it. If the flues are dirty or can only be cleaned out with difficulty, then the system is sure to prove a failure.

2. As to inlets and outlets. These should be large enough to admit the air in sufficient quantities at the proper rate of speed. If they are too small the air will have to pass in and out at a high velocity, which is sure to cause an unpleasant noise, and may cause drafts. They must also be placed in such a position as will insure perfect diffusion throughout the room, and perhaps the best way to obtain this in a general way is to fix them in one and the same wall at opposite corners. As a rule, the inlet openings should be near the ceiling and the outlets near the floor, but in special cases this position may have to be reversed.

3. As to connections between fresh air and foul air flues. Great care must be taken that these two kinds of flues have no connection, which may be caused through carelessly laid brick work, at points where they cross each other.

4. As to filters: The idea of filtering the fresh air is a very old one and there are a great variety of filters at work, from the simplest form to the most complicated. It should be borne in mind in selecting one that the finer it is the more power will be required to draw air through, and the sooner will its pores become choked. The experience gained with the filters described has been decidedly satisfactory, and they might be employed, or a filter might be chosen similar to the one in use in the Victoria Infirmary, Glasgow, care being taken not to over moisten the atmosphere.

A great many objections have been raised against the plenum system, not infrequently by those who are patentees of other ventilating appliances, and it would be useless to discuss them all, but there are one or two which it might not be out of place to consider here.

1. As to breakdowns of the machinery. It has been stated that if the engine breaks down, no fresh air can be supplied till it is repaired. In this respect natural or mechanical schemes

* Paper read by Mr. Ashwell before the British Association for the Advancement of science.

of ventilation, with this advantage, perhaps, that an accident to the machinery is at once noticed, and can be remedied without delay, whereas a breakdown in a patent cowl or some such appliance may not be noticed for a considerable time, as nobody attends to it. It would, however, not be true to say that during a breakdown no fresh air at all will be supplied. This would only be the case during the warm weather, and then the opening of the windows would soon remedy it. During a breakdown in winter the hot air will still, to some extent, ventilate the rooms till the repairs are complete. This would be the condition of things in cases where no duplicate power is provided, but where this has been done —either by an extraction tower as at Nottingham, or by a fan in the roof driven by the electric motor, or by a duplicate engine at the air inlet— then no inconvenience at all will be felt during repairs; and though this course will prove somewhat more expensive at first, yet in the long run it will be the cheapest, and should be adopted in all cases where a temporarily reduced supply of fresh air entails hardship or danger to life. If this is done, then it may safely be asserted that the plenum system is the most reliable system of ventilation.

2. As to scheme being too complicated. It is quite true that any scheme of mechanical ventilation is more complicated than schemes of natural or so-called automatic ventilation; but plenum schemes are by no means too complicated for successful working, as is proved by the experience gained in all parts of the globe.

To say that a natural scheme of ventilation is uninterruptedly at work all the year round is, to say the least, very misleading. It may be true that the atmosphere is always in motion, but then this motion may be so infinitesimally small at times as to cause no movement of air at all in outbuildings, a state of affairs well known to all those who have to rely on this kind of ventilation.

The addition of the machinery is a safeguard for the regular supply of air in the proper quantities, and it is far better and wiser in all matters concerning so immediately the health of countless thousands as ventilation does, to have a special man constantly attending to it, rather than leave it to itself and all sorts of mishaps.

3. As to cost of scheme. It is undoubtedly a most important matter to consider very carefully the cost of any ventilation scheme; but when comparing the expenses in connection with two different modes of ventilation for one building great care must be taken to place the two schemes exactly, as far as this is possible, on the same basis as to the purity of air supplied, the quantity, the regularity, the convenience of working them, &c. If this is not done the results obtained will be utterly useless and misleading; but wherever this is done, and all the circumstances of the case considered, the author is confident that the expenses in connection with the plenum system will not be found excessive. He had not prepared any figures, as he is of opinion that general figures are frequently totally misleading, and for this reason he would recommend the consideration of the question of cost afresh for each particular case.

The Brandt Submerged Water Heating Company of Toledo were incorporated recently. The object is the manufacture and sale of the Brandt submerged water heater in the territory east of the Mississippi, except Virginia and South Carolina.

Radiator on Boiler Level.

From Broomell, Schmidt & Co., Limited, *York, Pa.*—We have noticed with interest the communications and illustrations which have appeared in *The Metal Worker* in regard to the matter of heating radiators on a boiler level. One of the specialties which we manufacture is the Heatencook range (house heating from the kitchen fire). In this system it is necessary to use all of the first floor radiators on a level with the heater. We have over 100 jobs working on this plan, all of which are giving excellent and continued satisfaction. The proper plan for this work is to run the flow pipe to the attic and drop from this pipe to radiators below, or to run it under the ceiling of second floor, supplying third floor radiators from below and dropping to radiators on second floor and first floor. It is a mistake to connect flow pipes with a by pass under radiators, because the radiator above will work very unsatisfactorily. While it will take a little more pipe, it is better to run independent return pipes from as many radiators as possible, connecting these return pipes into the main return in cellar. We find that if the return from a small radiator on second floor is connected into the return of larger radiator on first floor the water will come down hot from the second floor radiator before the first floor radiator is hot all over, and the tendency is for the first floor radiator to heat from both ends, making a sluggish circulation and poorly heated radiator.

Feed Water Heaters.

BY L. A. N.

Comparatively few boilers used for heating purposes require to use feed water heaters. All such as are employed in gravity return systems, or where the water of condensation is returned to the boiler by a trap, being thus supplied with heated water, do not need feed water heaters. In rare instances, as in some large heating plants, a return system is not used and the water of condensation is trapped out and allowed to run to waste. This is sometimes the case also in smaller heating plants, so situated that the water of condensation cannot be conveniently returned to the boiler. In all such cases a feed water heater, besides preserving the usefulness of the boiler for a longer period, will be found an economical appliance, and, whether used for heating or for power, no boiler whatever should be fed with cold water.

People, as a rule, are willing to concede that a boiler fed with hot water will last longer than when fed with cold water. They also will admit that, because heating feed water prevents or greatly lessens the formation of scale in boilers, a boiler supplied with a feed water heater will steam more economically than without it. But there is a point in favor of feed water heaters not frequently considered. Any one familiar with the laws that govern the heating of liquids in boilers must see, upon due reflection, that the circulation in a boiler fed with cold water must differ greatly from that in a boiler where the temperature of the feed approximates the mean temperature of the contained water. If a quantity of cold water be injected into a steam generator it immediately seeks the bottom, forming there a layer which supports upon its upper surface the previously heated water, thus more or less separating the latter from direct contact with the most effective heating surface. In other words, the coldest part of the contained liquid is brought into contact with the most effective surface, which precisely reverses the condition of highest efficiency, so far as it depends upon the contact of the liquid with the heating surface.

When the liquid flows over a surface no hotter, or only a very little hotter, than itself, either no heat all, or a very little, is transferred to it; whereas, if passed over a much hotter surface it would rapidly take up heat. The cooler feed water, on the contrary, might take up considerable heat, if passed over the same surface. A cold layer of water at the bottom will have set up in it only a limited circulation between the bottom and the hotter water, because it will require considerable time to heat the cooler liquid to a degree that will render it light enough to rise to the level where the steam is liberated in the steam space. The time required will be much longer than with hot feed water, and hence, with the latter, the circulation will be far more active. As not only the rapidity of steam generation, but also the efficiency of boilers largely depends upon activity of circulation, it must be conceded that herein is an element of economy entirely independent of those usually allowed for heating feed water.

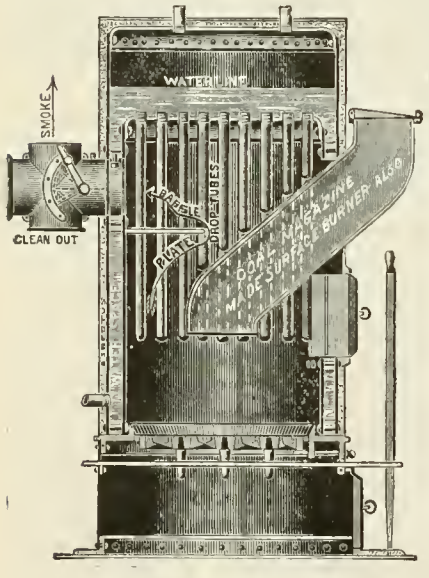
The Smith & Winchester Company,

Boston, Mass., issue a vary sumptuous volume relating to the goods that they handle. The book is an illustrated catalogue and price-list, 8 x 11 inches in size, and is handsomely bound in cloth. It is the second illustrated catalogue issued by this firm, and embraces all materials and tools commonly used in steam, gas, water and plumbing work. The lists in it are revised up to the date of issue and it is expected that few changes are likely to occur in the near future, though, of course, the lists and discounts are subject to change without notice. The frontispage is an engraving of a wind engine of the date A.D. 1700, and is a very quaint and interesting mill. At the beginning of the volume is a complete alphabetical index, covering some 12 pages. The catalogue proper begins with pipe, sections being given showing the thickness and sizes of wrought iron pipe, together with tables. These are followed by fittings of all sorts, malleable and cast, for various purposes. The next line of goods are valves and cocks, over 70 pages being given to this one department, showing how thoroughly the ground is covered. A large variety of steam specialties are included in this connection, such as governors, gauge columns, injectors, &c. Radiators are given a number of pages, many styles of direct and indirect being presented. Radiator valves are shown in great variety. Beginning with the plumbing department, which is on page 198, some 70 pages are given up to cocks, bibbs, stops and this class of goods. Bathtubs follow, many different kinds of shower baths, bath fixtures, lavatories, brackets, &c., being shown; next basins, closets, closet tanks. Cast iron soil pipe, traps and fittings are comprehensively treated, as well as

other cast iron goods, such as sinks, sink fixtures and bowls; miscellaneous goods in the line of boilers, towel racks and pipe hangers. Then come kitchen sink hoppers, followed by lead pipe, traps and bends and sheet metal pipes. Plumbers' and 'steam and gas fitters' tools comprehend a very complete line of these goods; in fact, some 50 pages are given up to that class of articles, including everything from a plain chisel and simple tools up to power machines. The pump department is particularly exhaustive, including over 100 pages. Hand pumps, power pumps, rams, &c., are included. Hydrants are given full attention, also driven well supplies; iron railings, hitching posts and crestings are noted. The end of the book, excluding a few pages given up to greenhouse fittings, is devoted to the wind engine department, which shows half tone engravings of many different types of wind mills. Scattered among the modern wind engines are several illustrations of old wind mills, such as were used 100 or more years ago, and which add very much to the interest of the department. Altogether the book is most thorough and complete, and will be welcomed by the trade.

The Keystone Heating Boiler.

We show in the accompanying illustration a sectional view of the Keystone heating boiler made by Broomell,



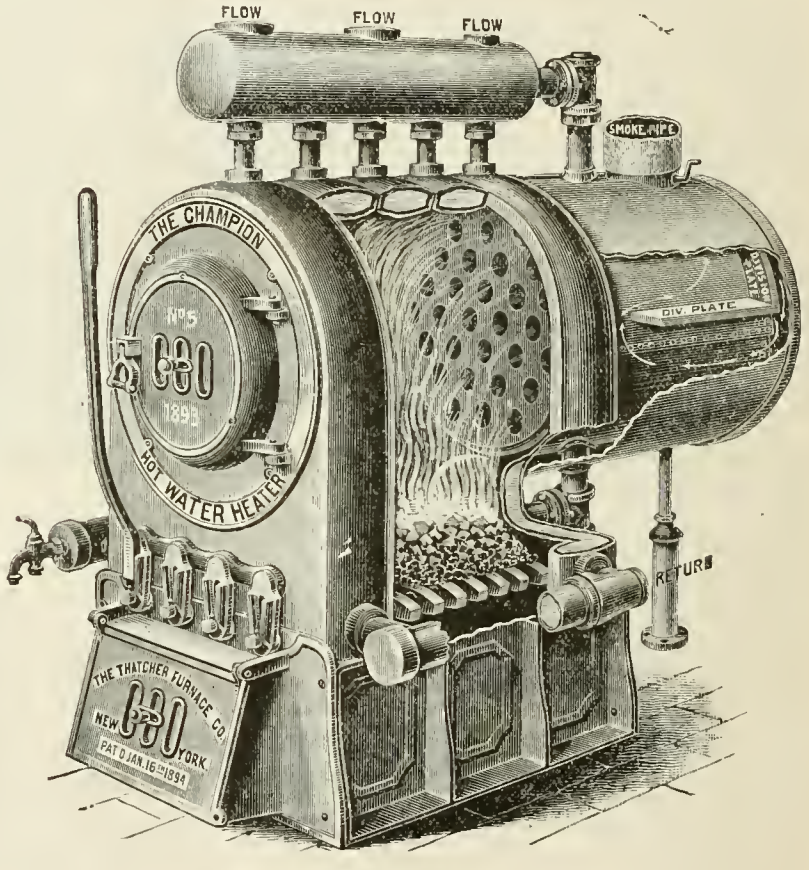
The Keystone Heating Boiler.—Sectional View of Boiler.

Schmidt & Co., Limited, York, Pa., with Philadelphia office at 146 North Third street. The illustration shows the boiler with a magazine feed and adapted to steam. It is, however, made without magazine, and for hot water as well as steam. In fact, the manufacturers prefer to supply the surface burning boiler, as it is the more economical in the use of coal. The boiler was designed to meet the demand for a heater that should not require brickwork. It is made of steel, and an especial point claimed for it is the large fire pot. The boiler proper, it will be noticed, consists of an annular water space with a drum at the top, to which drop tubes are connected. A baffle plate, as shown in the illustration, is placed on the drop tubes, extending half way to the front of the boiler and just below the opening for the smoke outlet, thus forcing the products of combustion to come in contact with all of the tubes. Particular attention is directed to the shaking and dumping grate, the grate bars being made with a double backbone, with air space in the center, and, it is claimed, will not warp or twist. The coal magazine is so arranged that it can be lifted out at any time, and when removed all the tubes are accessible for examination or cleaning. Another feature to which attention is directed is the patent combined smoke elbow and damper shown at the left of the cut. It is placed out of the way of the steam pipe connection and fittings, which enables the boiler to be set up in very low cellars. The smoke pipes to chimney can be attached to the top, bottom or side elbows, always leaving two openings available for cleaning the pipe or the top of the baffle plate. The manufacturers also direct attention to the damper shown in the cut. When the damper is wide open the cold air check doors on either side of the boiler are shut. As soon as the damper begins to close the check doors open and when the damper is closed entirely the cold air openings are full size. This combination of elbow and damper in connection with the automatic regulator furnished, it is claimed, control the draft and fire with great accuracy. Outside of the boiler, as shown, is a non-conducting jacket made of heavy galvanized iron, with a space between the jacket and steel shell filled in with asbestos sponge. The boilers are made for both hard and soft coal. The steam boilers are made in five sizes with diameter of fire pot 18 to 35 inches. The hot water boilers are made in the same sizes.

H. P. Blair and D. A. Westbury have formed a partnership under the firm name of H. P. Blair & Co. and opened a steam fitting and plumbing establishment at 118 Colfax avenue, South Bend, Ind.

The Champion Heater.

One of the newest candidates for favor in the heating trades is the Champion hot water and steam heater, illustrated in the accompanying cut. The apparatus, which has already been satisfactorily tested for both steam and hot water in a number of residences, is made by the Thatcher Furnace Company, 33 Peck slip, New York, who secured patents on January 16 for a combination of cast iron sections and a horizontal tubular return flue boiler. The cast iron sections are connected by nipples, with return headers at each side at the bottom and a flow header at the top, and a horizontal



The Champion Heater.

tubular section connects with the back cast iron section at the bottom and the flow header at the top. The back cast section is solid across the bottom and has a circular opening above, permitting a free entrance of the gases to the tubes in the horizontal section, which is enveloped in a shell, with flue plates so arranged as to give a direct draft or effect a passage down and to the front of a division plate, thus reaching all of the surface of the boiler as the gases escape to the chimney. Putting coal on the fire is made easy by an extra large door, which is to enable the flues in the tubular portion to be readily cleaned, while an opening at the back also gives access to the tubes and the indirect flues. The boilers have large combustion chambers, permitting the gases to be thoroughly ignited before they enter the tubes. The fire chamber is made 20 and 30 inches wide and increases 6 inches in length with each section, giving ample grate area for the surface exposed. A lever working grate is pro-

vided that is readily removed and there is a large ash pit. In the steam heater the top row of tubes is omitted, so that no tubes will be above the water line, and an automatic draft regulator is provided. The steam gauge is connected at the top and the water gauge at the right side connected on a level with the hinges of the fire door. The Champion is made in 12 sizes, the first 7 have respectively a hight of 54 inches and a width of fire chamber of 20 inches, while the larger sizes are 64 inches high and have a 30-inch fire chamber. The radiation they will carry is said to be very conservatively estimated and varies from 150 to 2000 feet for steam and from 250 to 3500 feet for hot water.

H. B. Smith Company.

We are indebted to the H. B. Smith Company, Westfield, Mass., for a copy of their lately issued handbook. The scope of this volume is well expressed in the following sentence, which we quote from the introductory notice: "This handbook was published for the purpose of combining within a limited space as much useful and practical information with regard to our manufactures as could be thus assembled, believing that such publication would correspond to the desires of our customers and work to our mutual convenience and advantage." In the present volume they have fulfilled this promise with unusual fidelity, for the publication is of a handy size, measuring 7 x 4½ inches, and is marked by simplicity and compactness. Although there are over 170 pages in it its thickness is less than ¼ inch, including the heavy binding of soft leather. It has evidently been the design of the publishers to present brief and accurate descriptions of their apparatus, and let the illustrations and few particulars of construction bear witness to the merits of the goods. As is well known, the H. B. Smith Company are makers of a large variety of heating boilers. The first section in the pamphlet is devoted to the Gold X L boilers; then come the Mercer boilers, then the Mills boilers; next the O K boilers and then the Cottage boilers. Following the boilers a section is devoted to Reed's patent rotating grate, followed by direct radiators, covering 30 pages; next the Whittier radiators; next indirect radiators, the latter covering 18 pages Breckenridge's automatic air valves are next noted, and the little volume closes with rules and practical data, some of the tables among the latter being particularly valuable.

HEATING NOTES.

The William H. Page Boiler Company, Norwich, Conn., send us a circular bearing extracts from the Portsmouth *Times* of January 10, 1894, giving letters from two persons in Portsmouth who have recently had Volunteer hot water boilers installed in their houses by J. M. Smith of that city. In both cases the writers speak in the highest terms of the apparatus.

L. S Bunker of the Bunker & Hazard Company, Webster City, Iowa, is stated by a local journal to have invented a sheet steel hot water and steam radiator which is claimed to have advantages in cost and radiating qualities over other forms of construction. The principle on which it is made is said to be an entirely new departure.

The Rex Heating Company, 85 Centre street, New York, are issuing a catalogue of 12 pages in a red cover devoted to the Rex hot water heaters that are specially adapted for small dwellings, stores, offices, bathrooms, conservatories and poultry houses. The illustrations show them in section and the various ways in which they are used.

The officers of the Herendeen Mfg. Company of Geneva, N. Y., for the ensuing year are: President E. W. Herendeen; treasurer, W. L. Herendeen; secretary. F. A. Herendeen; superintendent, F. J. Furman. The New York office of the company is room 46 in the Taylor Building, at 41 Cortlandt street, and is in charge of J. G. & A. H. Dudley. Some changes have been made in the process of manufacture of their Faultless Furman line and their plant extended and new machinery added. They have made some specially large boilers that will be used in the Harder Building, at 126 to 130 White street, New York.

F. Richter & Son, 382 to 400 Sixth street, Milwaukee, Wis., have recently taken some important heating contracts. They secured the Tenth Ward school house in the city of Milwaukee, and have also been awarded the contract to heat the Wisconsin Bridge & Iron Company's plant at North Milwaukee. They have invented a new fan system of heating for which they claim many advantages over older systems, the main point being that it is a cavity system when the fan is not in operation, obviating the necessity of direct radiation. They agree to change the air in a building every ten minutes and to furnish 30 cubic feet of air every minute to each pupil in the schoolroom. The apparatus is also constructed so as to automatically regulate the temperature of each room to the degree that may be desired. Not the least important feature of this system is its comparative cheapness. J. T. Ryan is manager of the heating department of he firm.

The American Boiler Company are to remove their Chicago office and salesroom from 34-36 Dearborn street to 84 Lake street.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

Mulligan & Schermerhorn, Troy, N. Y., are installing a heating plant in the residence of W. F. Burden, Newport, R. I., using two No. 6 Gorton steam boilers. A No. 2 was installed in his stable by them last fall.

McMann & Taylor, 42 Cliff street, New York, dealers in plumbers' and steam fitters' supplies, are furnishing all the materials for water and drain pipes in the Manhattan Life Insurance Company, in lower Broadway, just below Wall street. This colossal building will have the wrought iron drainage system, the bore of the fittings being the same as the pipe, minimizing the risk of stoppages at the joints. The plumbers having the contract are J. N. Knight & Son, 755 Seventh avenue, New York.

Fred Stoyle, Houghton, Mich., has the contract for resetting the boiler and rearranging the heating plant in the mining school building in that place.

W. J. Van Kewren has drawn the plans and will supervise the erection of a building to cost $75,000 and covering a space 83 x 248 feet, at Lake and Forest avenue, Chicago. The building will contain society halls, an auditorium and several apartment flats and will be heated by steam.

Bids will be received up to March 9 for heating and ventilating a four-room addition to the Butler Street School building at Lowell, Mass.

D. E. McNamara has been awarded the contract for doing the plumbing in the new addition to the Post Office building at New Haven, Conn.

Donohue Bros. are overhauling the plumbing of the Glendower Hotel, at Springfield, Mass., and putting it in a perfect sanitary condition.

The New York House, at 244 Water street, of the Raymond & Campbell Mfg. Company, Middletown, Pa., installed their Sun steam heaters in the Whalan Apartment House, a five story building, 50 x 100 feet, and in the store of Whalan Bros., at 155 Smith street, Brooklyn, a five-story building, 50 x 200 feet.

Gardenier & Vermullen, Paterson, N. J., are installing one of the Thatcher Furnace Company's champion steam heaters in the Eden Musee of that city. One thousand three hundred feet of direct radiation will be used and 500 feet of indirect.

The Philadelphia Steam Heating Company of Philadelphia have about completed the heating of the new mansion of John Pitcairn, at Bethayres, Pa. The building is in an exposed situation, and the indirect system of steam heating is employed. Two No. 5 Dunning boilers are used.

The contract for heating the Boardman Training School, at New Haven, Conn., has been awarded to the New Haven Steam Heating Company by the Selectmen.

The Kelly & Jones Company, 48-52 North Clinton street, Chicago, are to furnish a direct and indirect system of steam heating in the residence of E. A. Hammil, 2637 Prairie avenue.

The Wells & Newton Company, 274 Dearborn street, Chicago, are to furnish the plumbing and gas fitting in the new armory, Michigan avenue and Sixteenth street and Pierpont apartment building, Barry and Evanston avenues.

Among the contracts for hot water heating lately taken by the Theo. Jacobs Company, 72 74 Market street, Chicago, can be mentioned the following: Residence of Gustave Hesset, Lake View, and residence of C. H. Fitzhugh, Lake Forest, Ill.

Geo. Siegel, Carlinville, Ill., has secured the contract for the steam heating in Mr. Mueller's residence. A Florida boiler will be used.

The Rockford Construction Company, Rockford, Ill., are to install two No. 45 Spence boilers for the hot water heating in the residence of Mr. St. John.

Contracts for plumbing and gas fitting in the new National Union Building, at Toledo, Ohio, were let by the Building Board at a recent meeting. J. W. Groenwald, the St. Clair street plumber, put in the lowest bid, $4200, and was awarded the contract.

Sabine & Harvey, Boonville, who are about to locate at 74 South street, Utica, N. Y., have secured the plumbing contract for the large hotel of C. M. Barrett & Co., Third Lake, Fulton Chain, N. Y.

PLUMBING and GAS FITTING.

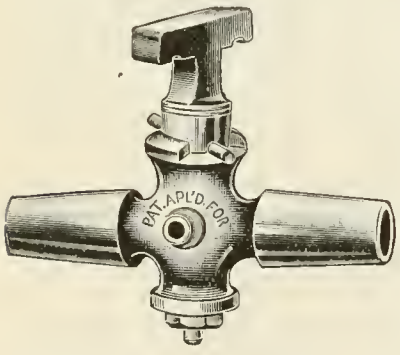
Maryland State Plumbing Commission.

The State Board of Commissioners of Practical Plumbing have prepared their report to the Governor. The board is composed of Dr. John Morris, president; Wm. H. Rothrock, secretary; Dr. J. F. McShane, John Trainor and John M Haupt. In their report the board say: During the year 1892 the board examined 407 applicants, issued 397 certificates, rejected 17 and deferred 11. During 1893 the number examined was 339, of which number 324 received certificates and 15 were rejected.

The law is a necessary and popular one, and if intelligently and honestly carried into effect must result in great good to the public. Although not many convictions have been secured, owing to the peculiar constitution of juries, the law has acted as a deterring influence, and our citizens have been protected in a very large measure from the ignorance and unscrupulousness of incompetent mechanics. The examinations of the board have not been unduly rigid, for the reason that the board did not deem it advisable to deprive men who had been engaged in plumbing for years before the enactment of the law of a means of livelihood. It is believed, however, that a class of young men are coming on who will be more thoroughly educated in sanitary knowledge, and who will be able to fulfill scientifically and intelligently all the requirements of their calling.

The Perfect Check and Waste.

The accompsnying cut shows a new check and waste manufactured by the Perfect Check & Waste Company, 189

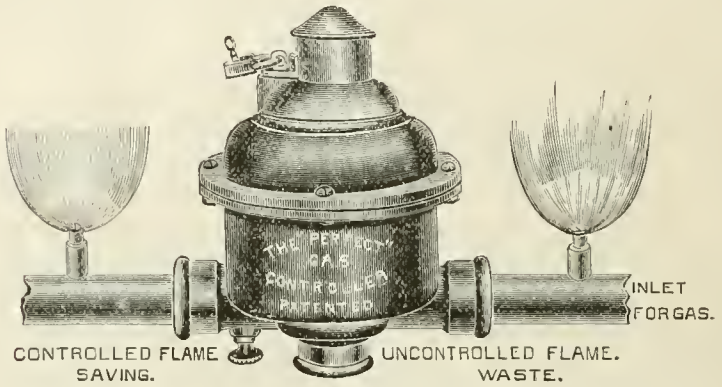


Perfect Check and Waste.

and 191 La Salle street, room 92, Chicago. It will be observed that this check is double guarded, and it is, therefore, specially adapted to contract or jobbing work, as the guard cannot be broken by even the most careless mechanic or tenant, thus overcoming a great annoyance at present encountered by the trade. It is furthermore pointed out that it cannot become set, because the double guard acts as an axle, and the weight of the rod cannot depress the core or allow it to become set. The top of the check being rounded, it presents a free passage for the wire, with no sharp corners to cut the wire when the rod is in a leaning position.

The Perfect Gas Controller.

The Brownhill Company, 141 and 143 Ontario street, Chicago, are manufacturing, under the name of the Perfect gas controller, a new device for regulating the pressure of gas on a consumer's premises. Illustrations are herewith presented, Fig. 1 showing the controller and Flg. 2 giving a sectional view to demonstrate the principle on which it operates. It is an automatic tap, intended to be fixed to the gas service pipe, opening or closing as the lights in the house are turned on or off and as the pressure increases or decreases from the street main. As the same pressure of gas is not required for, say, two or three burners as for ten to twelve, it is reasonable that a given number of outlets in a house cannot require a force of gas three times greater at one period of the evening than at another. Yet ordinarily there is no arrangement provided by which the pressure is controlled and the supply of gas fed to the burners just as required for the service. There is no question that under such circumstances much more gas is burned than necessary when but few burners are used, and a consumer does not reap the full benefit of his economy in extinguishing other lights. But a more potent cause of excessive gas bills is the great pressure often applied by gas companies to enable them to force gas to consumers located at a great distance from the works. The device made by the Brownhill Company is to reduce and regulate the gas pressure and is claimed to be simple and durable. The parts are interchangeable and can be replaced by any one without removing the body from the pipes. It is stated to be as applicable for ten burners as for 1000. All sizes are made from those to be applied to ⅛-inch pipes up to 4 inches or even larger if desired.



The Perfect Gas Controller.—Fig. 1.—General View of Controller.

The sectional cut, Fig. 2, is thus explained: A, outer casing or body of controller; A1, lid or cover; B, mercury trough; B1, mercury, which is poured in through inlet O after the controller is fixed in position; C, cover to mercury trough, removable for cleaning if necessary; P, valve box, also removable; E E, double inlet for gas; F F, equilibrium valve arranged to secure a steady flow of gas under all pressures; G, spindle connecting valves with float, H H, guides to keep spindle exactly upright; I, syphon screw to let out condensation if necessary; K, float, which rises and falls in mercury with the varying gas pressures; L, loose thimble for carrying weights; M, regulating weights for modifying the action of the controller; N, brass cap, which is secured by padlock; N1, eyelet for padlock; O, inlet for mercury; O1, outlet for mercury in case of removal. When the gas enters the controller it passes first through the double inlet E E, and out through the double valve F F, and so under the float K, which, rising or falling according to the varying pressures from the main and the varying

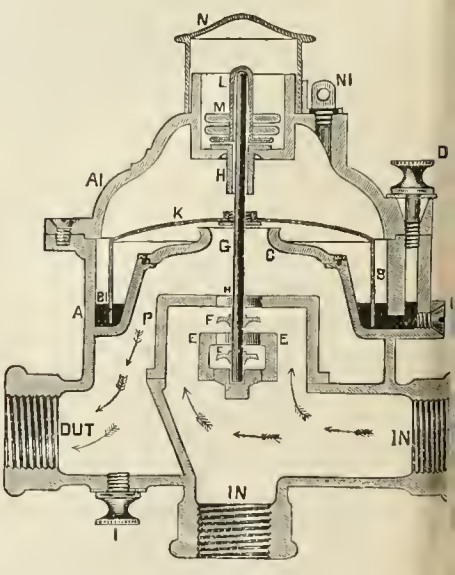


Fig. 2.—Sectional View of Controller.

consumption, opens or closes the valve. Several lead weights are supplied with each controller by means of which the defined force of the gas may be modified according to the permanent requirement. Thus if the delivery is found to be scarcely sufficient, a weight placed on the thimble L will increase the regu-

lar preasure. On the other hand, if the force is found to be too great, the removal of one of the weights will at once reduce it.

The pressure of gaa supplied to burnera should not exceed six-tenths; at this pressure it combines with the oxygen of the atmoaphere and causea a perfect combustion for illumination. The flaring or roaring flame is the only indication of waste to an ordinary obaerver, and when auch roaring occura the waate, it ia aaid, is from 50 to 60 per cent., and a waste aay of 30 per cent., it is claimed, would not be noticed, as there ia no perceptible noise to call attention.

The Brownhill Company publish a descriptive circular giving a number of very strong testimonials from uaers of their controller.

Meriden No. 27 Bracket.

The accompanying illustration shows Meriden Malleable Iron Company's new No. 27 bracket, with alab bar or metal apron. This bracket is intended for use in connection with alabs in place of the marble aprons heretofore commonly used. This combination, it is claimed, makes a much more artistic piece of work thau aprons of other kinds and, in addition, supports the front of the alab better than where brackets alone are used. These are made to conform to any size of alab, are furnished in brass and nickel, are light and artiatic in finiah and their atrength is guaranteed all that ia required to support any style of alab. Besides a variety of bracketa now ready, the Meriden Malleable Iron Company, Meriden, Conn., who manufacture the article illustrated, are preparing a line of novelties in aponge holders, soap dishes, towel racks, &c.

TRAPS AND VENTS.

Pelman Hague has opened a plumbing shop on West atreet, Pittsfield, Mass.

The store recently vacated by Fred. Disbrow, at Bridgeport, Conn., is now occupied by Spicer Brothera, who will carry on a general plumbing and tinning business.

A plumbing shop will be opened in Gates' block, Fenn atreet, Pittafield, Mass., by Wealey Noble.

John M. and H. C. Robertson have purchased the plumbing, gas and steam fitting business of Heisel & Co., at Stillwater, Minn.

The plumbing firm of Booth & Ballantyne, Montreal, Canada, have been registered as dissolved.

Plans were recently submitted to the Building Inspector for a four-story addition to the plumbing establishment of John D. Johnson & Co., on the west aide of Seventh street, below Race atreet, Philadelphia. The property next door to the preaent building was purchased recently by the firm and it is on this aite that the new structure is to be erected.

The John Schoen Plumbing Company were recently incorporated at St. Louis, Mo., with a capital atock of $10,000.

Portsmouth Machine Company, Portamouth, N. H., manufacturers of plumbers' brass supplies, castinga and Critchley's patent expanding reamer, issue a price list of rough brass fixings and aoldering nipples and unions.

E. W. Lang & Co., Portland, Maine, are manufacturing drop aolder for canners' use by an automatic machine, which turna out 25 pounds per minute. Any size from 32 drops to the ounce up can be made by regulating the gearing. They also manufacture atick and wire aolder and patent steel can cappers.

Zalmon Goodsell, the well-known master plumber, acted as toastmaster at the annual meeting and banquet of the Sons of the American Revolution, held last week at Bridgeport, Conn. It was an occasion of more than ordinary interest, and its success ia aaid to have been largely due to the labors of Mr. Goodsell.

Robert M. Vannan haa rented one of the atores in the new Odd Fellowa' Building on Salem avenue, Carbondale, Pa., and will remove hia plumbing business there.

A meeting of the Kennebec Master Plumbers' Association was held at the Elmwood. Waterville, Maine, recently, and G. F. Learned of Waterville, Maine, was elected vice-president.

Wm. A. Webber & Co., Beverly, Mass., plumbers, have dissolved partnership.

Case & Co., having bought a good portion of the late H. F. Spencer stock, have now located their plumbing and heating shop at 217 North Adama street, Green Bay, Wia., and are prepared to do all kinds of plumbing, gas fitting, ateam and hot water heating, also sewer work.

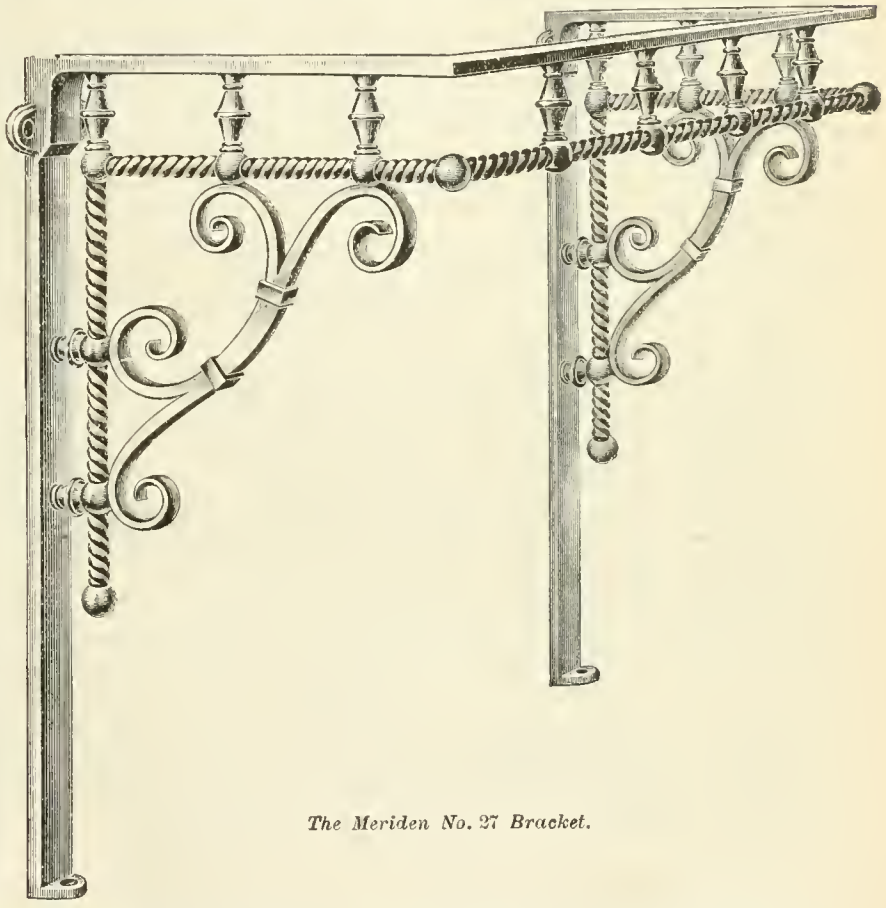
John O'Brien and Albert Rauf have opened a plumbing shop at 35 Hendricks atreet, Fort Wayne, Ind. The name of the firm will be O'Brien & Rauf.

Major L. N. Middlebrook, a Bridgeport, Conn., plumber and known at the national conventions as the "Old War Horse from Connecticut," made a telling response when Toastmaster Goodsell called on him to honor the memory of Gen. Gold Sellick Silliman, one of Connecticut'a Revolutionary heroes, at the banquet given by the Sons of the American Revolution.

John Shine and P. Love have gone into the plumbing business under the firm name of Shine & Love, and have leased the room opposite Jarman's drug store, Elm atreet, Trenton, Mo.

Ephrem Duford and Joseph Barrette have registered as partnera in the plumbing business at Montreal, Canada.

The Bradford, Pa., School Board, says the Oil City *Blizzard*, has condemned a school house on the ground that it "has no roof, no floor, very bad windows and no ventilation." In no way can persona more readily display their inconsiatency than by being unreasonably exacting. What do the claquers want? Here is a achool house with neither roof, floor nor windows, and yet complaint is made about the inadequacy of the ventilation. Only on the ground that the entire atmosphere of the place is contaminated can this be considered reasonable.



The Meriden No. 27 Bracket.

A new office created in Brooklyn is that of sanitary engineer and will be filled by William S. Johnson, B.S., of 471 Halaey street. Mr. Johnson will have charge of the plumbing bureau and will be expected to watch the dralnage of the city, the ventilation and drainage of houses and the sources the water aupply. Under Mr. Johnson's supervision new regulations as to plumbing, drainage and ventilation will be prepared.

We are indented to the Henry McShane Mfg. Company, Baltimore, Md., for a copy of the advance circular C of the bath and lavatory specialties of their manufacture. The volume, of over 50 pages, is 10½ x 8 inches in aize, neatly

bound in heavy paper. The goods shown begin with illustrations of lavatory legs in a variety of styles, brass brackets, then basin fixtures, bathtub fixtures, shower baths of various sorts, needle baths, &c., some 15 different styles of baths of this kind being illustrated. Bath and lavatory fixtures are noted. The Henry McShane Mfg. Com pany also publish a revised price-list of brass fittings, of which illustrations are shown in connection with tables of prices and sizes.

P. J. LYNCH, manager of the Dececo Company's Boston branch, is a candidate for the office of Sewer Commissioner for the town of Melrose, Mass.

ANDERSON & PAYMOND have recently opened a plumbing shop at 104 Charles street, Boston, Mass. They will also do coppersmithing and cornice work.

SABINE & HARVEY are about to remove from Boonville, N. Y., to 74 South street, Utica, N. Y., where they will be located after March 10. They inform us that they would like to have manufacturers send them their catalogues, prices and discounts on hardware, tinware, plumbing goods, &c., as they expect to engage in the tin and plumbing business in Utica.

THE PLUMBING AND STOVE STORE of Geo. Bradford, at Phenix, R. I., was destroyed by fire last Sunday night.

E. BAGGOT, 169–171 Adams street, Chicago, is to establish a branch house for the sale of gas and electric fixtures at 902 Olive street, St. Louis, Mo.

R. H. ELLITHORPE has bought the interest of W. H. Johnson of the firm of Ellithorpe & Johnson and will continue the plumbing business at 354 Niagara street, Niagara Falls, N. Y.

JAMES GRAY, plumbing inspector for the Board of Health of East Albany, N. Y., states that a set of plumbing regulations is being prepared for the approval of the local authorities. He has recently invented and is putting on the market an extension sink bracket, made to fit any size of sink from 14 x 20 to 20 x 40, which he will show by an aluminum sample at the master plumbers' convention at Buffalo, N. Y., March 6.

C. C. TODD, formerly with the Walcott-Hurlbut Company, has accepted the management of the Chicago branch of the Alberene Stone Company, 219 Dearborn street, manufacturers of laundry tubs, sinks, &c.

THE ST. LOUIS SANITARY COMPANY of St. Louis, Mo., are erecting in that city a sewage reduction plant with a capacity of 300 tons daily, and have satisfied the Board of Health that no offensive odors will arise from the work.

W. C. BODINE has purchased the store and plumbing business of C. K. and C. W. Larabee, Bellows Falls, N. H.

THE FIRST ANNUAL CONVENTION of the Association of Master Plumbers of the State of Michigan was held at Grand Rapids on February 27. At the first session 30 delegates were present. President James Meathe of Detroit called the meeting to order with an appropriate speech and the first day was given up to the report of officers and routine business and the evening devoted to the reading of papers of interest to the trade.

ARTICLES OF ASSOCIATION of the Michigan Heating & Plumbing Company were filed in the office of the county clerk at Jackson, Mich., last Monday. The capital stock is placed at $10,000, of which $4110 is actually paid in. The company consist of Julian S. Leet, Wm. H. Hamilton and Frank H. Close.

GEORGE CROW has leased ground on Union street on Central block lot, Bellaire, Ohio, and is putting up a building for a plumbing shop.

The Metal Worker acknowledges the receipt from the Master Plumbers' Association of Buffalo, N. Y., through Secretary Charles F. Menach, of an invitation to participate in the entertainment provided for the delegates to the State Convention of Master Plumbers. A theater party, a reception and smoker and a drive, on the different days of the convention, are the features.

The Chicago Master Plumbers.

The Chicago master plumbers held a meeting at their hall, 197 Madison street, Monday evening, February 26. In the absence of President Paul Redieske Vice-President Thos. Conway presided. A letter was read from President Redieske stating that his health had greatly improved since his visit to Hot Springs. J. Barrett, 54 Dearborn street, was made a member of the association. J. J. Wade presented a report of the Executive Committee's proceedings, stating that there was a loyal feeling among the plumbers throughout the country toward the National Association, and that new organizations were springing up, even in places where there were only a few plumbers. The Arbitration Committee reported progress in its work. Wm. T. Geary was appointed a committee of one to report on a plan of protection against professional dead beats, who run up a bill with one plumber and then patronize another. It is proposed to put a stop to this practice. There were many letters of regret received from members of the craft who were unable to attend the entertainment and ball recently given by the association. A vote of thanks was extended to the talented artists who assisted in making the entertainment a success. Through the courtesy of the secretaries of many plumbing organizations the Chicago association has been made acquainted with the wages and hours of labor of plumbers throughout the country. In this respect Pittsburgh is said to "take the cake."

Lawrence Shuster, Jr.

Lawrence Shuster, Jr., originator of the soil pipe and fittings business carried on under the name or style of the Shuster Foundry of Philadelphia, and South Pittsburg, Tenn., died on February 19 at his home in Philadelphia, of pneumonia. He was born in Philadelphia, April 6, 1852, and was educated at the Zane Grammar School, Filbert street, in that city. At the age of 17 he was apprenticed to the firm of Weaver & Pennock, plumbers, and stayed with them a year and a half, when he suffered from lead poisoning and went West for the benefit of his health. After six months' recuperation he returned to Philadelphia and associated himself with Hughes & Bros., plumbers, at Eighth and William streets, with whom he completed his apprenticeship. He then started in business for himself at 712 Callowhill street, where he remained 14 years, and until the Board of Health of the City of Philadelphia instituted a system of plumbing inspection, when he was appointed one of three inspectors under the system. This position he held about seven years, during which time he designed and introduced the Sure Seal specialties, now so widely known to the trade. The reception accorded these specialties proved so satisfactory that he decided to relinquish his position as inspector and devote himself to the manufacture and sale of the specialties. He accordingly opened an office and store at 717 Willow street, in Philadelphia, and did a good business. In 1892, becoming convinced that he had laid the foundation for a good business in sanitary fittings, he sought an opportunity for its development, and with Joseph Lodge, Wm. Lodge and his brother, Frank Shuster, formed a company under the name or style of the Shuster Foundry, for the manufacture of cast iron soil pipe and fittings of all kinds. Their buildings and plant were established at South Pittsburg, Tenn., in close proximity to the works of the Tennessee Coal & Iron Company, of which works Joseph Lodge was and is superintendent. The works were operated from the com-

LAWRENCE SHUSTER, JR.

mencement by Wm. Lodge as manager and Mr. Shuster looked after the trade in the East, using his place of business in Philadelphia as headquarters. The new concern soon acquired a reputation for the high quality of their goods and the variety of their fittings, and their business grew so rapidly that early in 1893 it became necessary to seek larger quarters for the Philadelphia establishment. Then it was that the property in which they are at present located was purchased. Mr. Shuster was a man of good ideas and executive ability, and he speedily adapted the premises to the requirements of the business. With larger premises an impetus was given the business and the results for the year were exceedingly satisfactory. All the pipe and fittings sold were guaranteed as to quality, and this fact helped not a little to swell their sales. The foundry at the present time is furnishing employment to over 100 hands.

Mr. Shuster was highly esteemed by the trade in Philadelphia and throughout the East. He was of a kind and cheerful disposition, and his manner was pleasing to all with whom he came in contact. During his inspectorship his decisions were conceded to be most fair, and met with hearty approval, and there were many who regretted his retirement from the public service. Although of generally robust health, his illness lasted but four days.

Press Working of Sheet Metals.—II.

BY OBERLIN SMITH.

Classification of Presses by Method of Support.

Another classification in commercial use is founded upon the fact that some presses stand upon the floor, either upon legs attached to the frame, as in Figs. 11 and 12, Chapter I, or with a base extending downward from the frame proper and resting upon the floor, as in Fig. 13, Chapter I, or in cases like Figs. 14, 21 and 22, Chapter I, where the bed is thick enough up and down to nearly or quite reach the floor, and does not need to be artificially raised up therefrom.

In contradistinction to these floor presses, whose peculiarity is usually not mentioned as such, are the bench presses, so-called, which are usually set with their bases resting upon an ordinary work bench, or in some cases upon one made lower than usual. The type of frame usually employed in such presses was shown in side and top views in Figs. 1 and 2, and in front and top views in Figs. 7 and 8, Chapter I. Drop presses, as in Fig. 22, Chapter I, are often used in this way also when they happen to be of small size. It is obvious that press frames can be mounted directly upon a bench in this way only when the depth of the bed is considerably less than the usually convenient hight for setting the top of the press bed above the floor, which is generally about 32 inches.

Obviously other classes analogous to these might be established, as, for instance, wall, ceiling and suspension presses. As a practical matter, however, the former two of these are rarely used. An instance of the latter is seen in the portable steam, pneumatic and hydraulic crabs which are used for punching and riveting, mostly upon boiler and ship work, and which are usually suspended from a trolley above and driven through the medium of a fluid conveying hose.

Classification by Kinetic Construction.

The next general method of classifying presses is by their kinetic construction, and they are often named after some important member of the driving mechanism, as for instance lever presses, screw presses, toggle presses, crank presses, &c. Before analyzing the kinematics of the subject more in detail (when, by the way, I will for convenience include drop presses, considering the center of the earth as pulling the ram down by an imaginary cord) it will be well to look for a moment at Fig. 1 and consider again the primal principle involved in all machines of this character. I have here shown the simplest possible form of press which would properly guide and strike together the two dies U and L, shown in dotted lines. It is, of course, but an amplification of the round stick

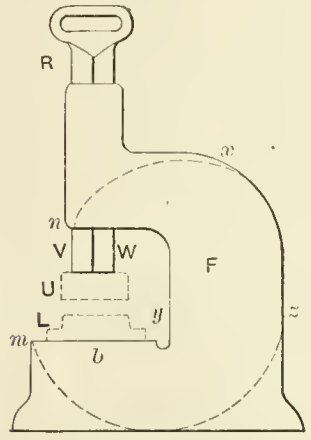


Fig. 1.

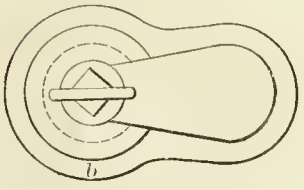


Fig. 2.

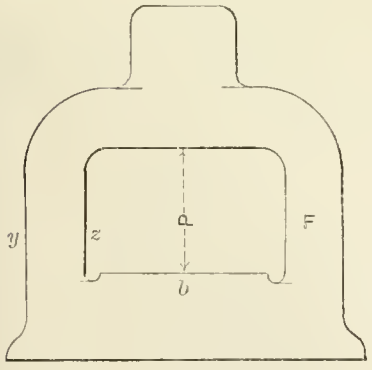


Fig. 7.

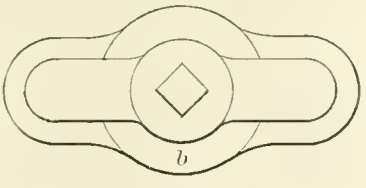


Fig. 8.

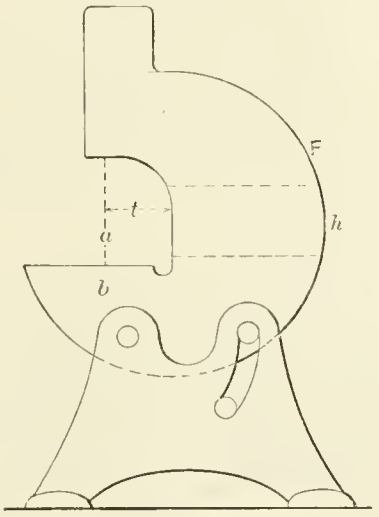


Fig. 11

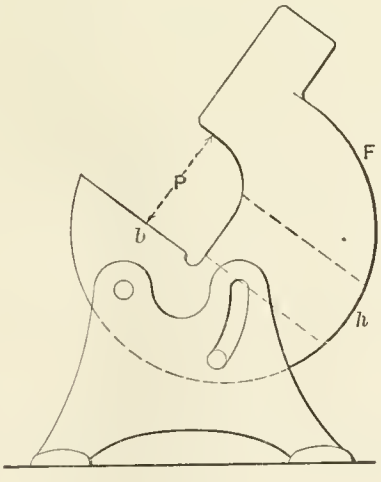


Fig. 12.

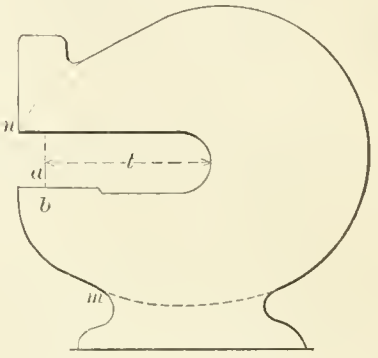


Fig. 13.

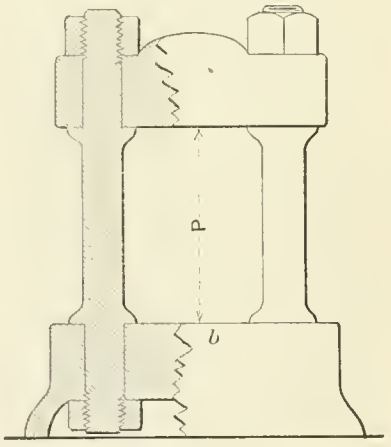


Fig. 14.

Fig. 16.

PRESS WORKING OF SHEET METALS.

of the primeval savage, slid by the pressure of one hand through the other hand closed around it as a guide, and pushed down over a hole in a flat stone, as imagined in the early part of the last chapter. In this case the ram R is shown of a rectangular cross section at *v w*, that it may not revolve and alter the relation of the dies to each other. It can obviously perform, within certain limits of pressure, all the functions of a press if the ram is simply pushed down by the hand of the operator. Indeed, such presses, with a spring added to lift the ram, are frequently seen upon office desks for embossing documents of various kinds. If it is worked upon a somewhat different principle, by the ram being lifted and allowed to do its work in falling, it then becomes a true drop press.

In Figs. 25 to 46 inclusive are shown a series of rams, R, with the press frames which guide them omitted, and with the various driving mechanisms crudely indicated by mere lines, which will, however, serve to show the principles involved. At F are shown the lever fulcrums which abut upwardly within some part of the frame structure. At *s* are shown the respective shaft bearings used in the case of power presses. These in Figs. 36, 37, 38 and 39 evidently also abut upwardly.

Describing these diagrams: Fig. 25 shows in side view section a hand lever press; Fig. 26, a foot pendulum press; Fig. 27, a foot lever press; Fig. 28, a hand lever toggle press; Fig. 29, a foot pendulum toggle press; Fig. 30, a foot lever toggle press; Fig. 31, a power crank lever press; Fig. 32, a power cam lever press; Fig. 33, a power crank lever toggle press; Fig. 34, a power cam lever toggle press; Fig. 35, a power toggle press; Fig. 36, a power crank press, ordinarily known simply as a power press; Fig. 37 is a front view of the same with the ram at down stroke; and Fig. 38 a front view of a power double crank (sometimes called a double pitman) press. These latter are often used for large work, where the ram needs to be very long from right to left, and would not very well maintain its parallelism with the bed were it driven down at one point only. In Fig. 39 is shown the ram of a double action press, driven down by cams working upon rollers, and a plunger, P, sliding inside of it, driven by a crank and pitman. Fig. 40 shows a hand screw press, with the nut *n* abutting upward in frame. Such presses are sometimes driven by power, also by means of any appropriate arrangement of reversible gearing connected with the screw. Fig. 41 shows a hand drop press, wherein muscular action stores up the energy developed by gravity rather than performs direct work, and in Fig. 42 is a foot drop press. In both of these cases the ram is lifted by a downward pull upon a cord or strap running over a sheave at *s*. In some cases such muscular action is assisted by a pulley at *s* being made to constantly revolve by power, the tightening of the cord giving nearly sufficient friction to raise the ram, which, however, falls and slides the cord over the pulley when no downward pull occurs at the other end. In Fig. 43 is shown a drop press with a roller lifter for the ram; and in Fig. 44 a crank lifter drop press. The rollers and crank are respectively driven by power, the rollers being separated when the ram is to drop, or, in the other case, the crank being thrown out of gear with its driving shaft. Fig. 45 shows a pneumatic, steam or hydraulic press, the ram being driven in one or both directions by a piston in cylinder *c*. In Fig. 46 is represented one form of a magnetic press, where the ram is actuated by a solenoid consisting of a bar of iron, *s*, which is drawn into a helix, *h*, or its equivalent, when a current of electricity is passed through the wires *w w'*.

Classification by Power Applied.

Press nomenclature enjoys another system of classification, which has, perhaps, been sufficiently indicated in the last paragraph, consisting of the kind of power applied. Thus we have various members of the family christened as hand presses, foot presses, power presses, hydraulic presses, &c. It is sometimes the case, however, that a foot press is supplied with a power attachment and that a power press is equipped so that it can be worked by hand, usually by fastening a crank to the fly wheel thereof. Again, a hydraulic or magnetic press is really a power press, because power, in the conventional sense of the term as derived from a revolving shaft, driven by steam or otherwise, has been used to force the water or electricity through the pipes or wires connected with the press. On the other hand, a hydraulic press might have its water supplied by a hand pump or even by a device supplied with a foot treadle.

Classification by Functions.

Still another classification is commonly used in the commercial baptism of the useful machine which we are considering, viz., that of functions. Thus we have the word press prefixed with the adjectives shearing, punching, cutting, forming, bending, embossing, coining, stamping, drawing, deepening or reducing, broaching, &c., almost *ad infinitum*.

Classification by Materials Worked.

Whether or not the classifications which we might elect to use are infinite in number it matters not; the fact remains that there seem to be an inconveniently great quantity. I will, however, mention but one more, which is derived from the material worked upon, thus giving us such names as tin presses, leather presses, soap presses, pill presses, brick presses, &c., the last three being, perhaps, distant cousins of the sheet metal press family, although much like them in many points of construction and in the employment of the general principle of compressing and embossing the material used, very much after the manner of an ordinary coining press.

From the above paragraphs it will be seen that when a sheet metal worker wishes to select a press from among the numerous kinds and sizes so freely advertised in the market, he will find them classified and named by their motions, their position, their shape of frame, their method of support, the kinetic principle of their driving mechanism, their mode of obtaining power, their functions and the material used in them. Furthermore, these distinctions are overlapped and interwoven with each other in every imaginable direction, as, for instance, when any one of a half dozen distinctly classified presses may with equal facility be sold him for a cutting press, or where all sorts of functions may be performed by a power press, &c. His only recourse is to have a general knowledge of the whole subject. This he must use judiciously, in connection with the advice furnished him by the press maker, so as to get a machine to suit him, regardless of what particular string of adjectives (as numerous, perhaps, as the Christian names of a Spanish duke) may be tacked on to the particular article which he will finally select.

Literature of Presses.

In commencing this treatise I had no intention of making it a natural history of the press family, although it has seemed necessary to treat all the different varieties somewhat in detail in order that subsequent descriptions of dies, together with the materials worked in them and the operations thereupon, may be clearly understood. Were it a thorough-going treatise upon the machines in question it might well of itself occupy a bulky volume, which should properly include a score or two of portraits in perspective of the various machines above referred to. There is, however, another reason besides lack of space for omitting such a set of pictures, viz., because it would be difficult to so limn them as not to make apparent some of the designs of well-known makers which are in the market, and thus lead to a suspicion of invidious distinctions, unless indeed it were possible to take composite photographs of all the good presses of each particular kind.

As far as the writer knows, the literature of this subject, outside of press makers' catalogues, is extremely limited. It is, however, to be hoped that in the not too far off future some competent author will give to the world a comprehensive biography of a family of machines which are far too useful to remain much longer in the realms of literary oblivion.

Such of my readers as are interested in analyzing more closely some of the various points involved in the mechanism of ordinary power presses, I will refer to a paper read by me before the American Society of Mechanical Engineers some years ago, entitled, "Power Press Problems," which will be found in Vol. IX, page 161 of their "Transactions." From this paper I quote a few paragraphs, as follows:

"To the maker and user of machine tools, which are often quite complicated in their construction and action, the machine commercially known as a 'power press,' may seem too simple to require any literature of its own. If the motions are analyzed which are required in the two general classes—machine tools and presses—it will be found in machines of the planer type, for instance, that it is necessary to move either the work or the cutting tool in an accurately straight line to a considerable distance against a cutting pressure, and in two other straight lines, both at right angles to this first line, and one of which has its direction adjustable to make an infinite number of angles with the other. For the necessary feeds and adjustments, these motions must be in both directions, and in the case of the first mentioned one the backward or return motion must be much faster than the forward motion.

"In machines of the lathe type, in which may be included screw machines, milling machines, boring and drilling machines, &c., there is frequently a similar set of motions to the last two described for the planer; while for the first named rectilinear movement is substituted a rotary one, so as to produce cylindrical and conical surfaces instead of planes. In both types of machines many of the motions must be reversible, intermittent and variable in speed. These requirements, together with all

the adjustments necessary, and the great strength and rigidity which ought to be, but are not always, embodied in such parts the writer has elsewhere advocated in writing of the 'anvil principle' *vs.* the 'fiddle principle' when criticising the extreme flimsiness of many of the machine tools in the American market. . . ."

A power press, "to a casual mechanical observer who had not studied it as a specialty, would seem to be far easier to design than the machine tools proper, mentioned above, but after taking it up as a specialty his judgment would be reversed, and he would find several knotty problems to keep him awake at

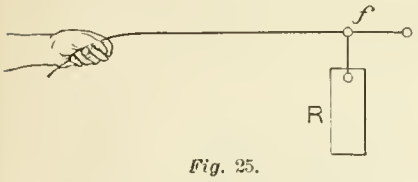
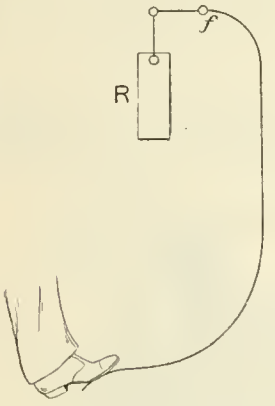


Fig. 25.



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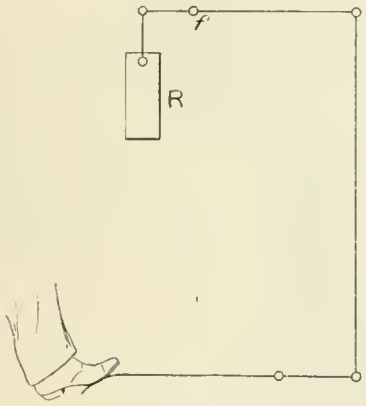

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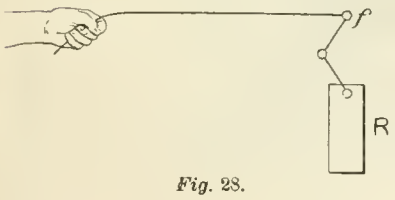

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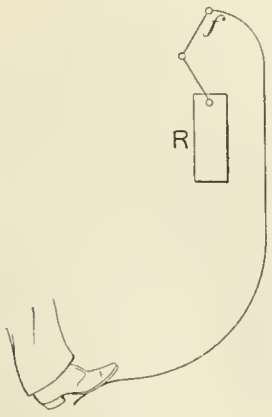

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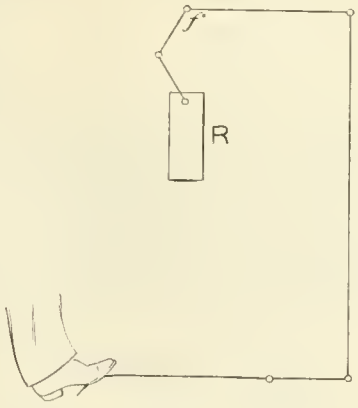

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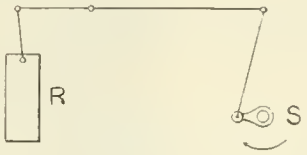

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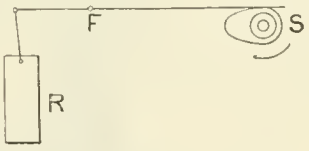

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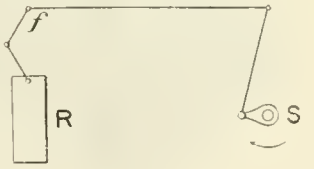

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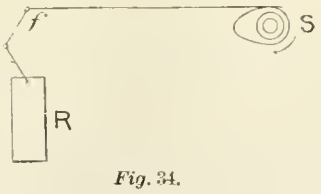

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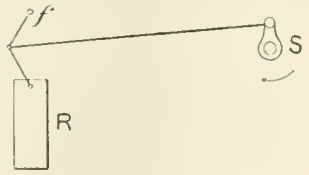

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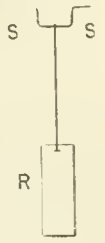

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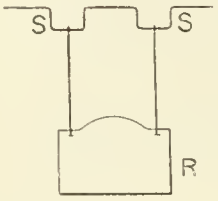

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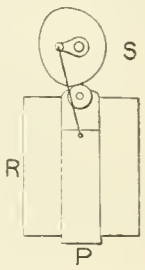

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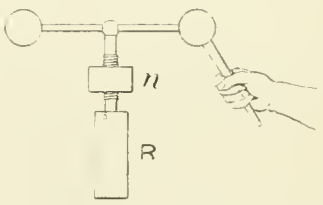

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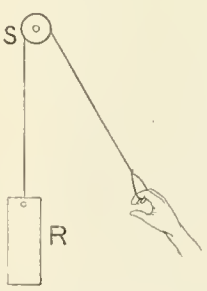

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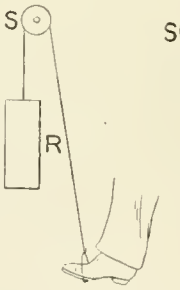

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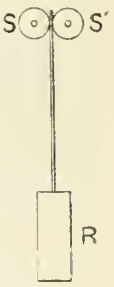

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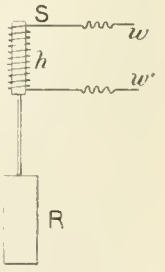


Fig. 46.

PRESS WORKING OF SHEET METALS.

night while the builder of lathes or planers was quietly sleeping the sleep of the just. This difference arises partly from the fact that power press building is both a newer and a smaller industry than the making of machine tools. It has not been so fully experimented with either in point of time or in regard to the number of experiments —in other words, these machines have not arrived at the same stage of development in the evolution of their race as have the older and more numerous tribe of lathes and planers.

"A more important difference, however, lies in the fact that machine tools are subjected to very little percussive action, while all the parts of a power press are constantly endeavoring to hammer themselves and each other to pieces. This is due chiefly to the fact that the work in the dies offers a sudden resistance to the moving parts when it is struck; and, incidentally, to the sudden stopping and starting of several heavy members of the machine while the wheel which drives them revolves at a constant speed.

"As a consequence of these conditions one of the problems arising is, how to fasten the parts together so that nothing will jar loose or come apart while in action. . . . ."

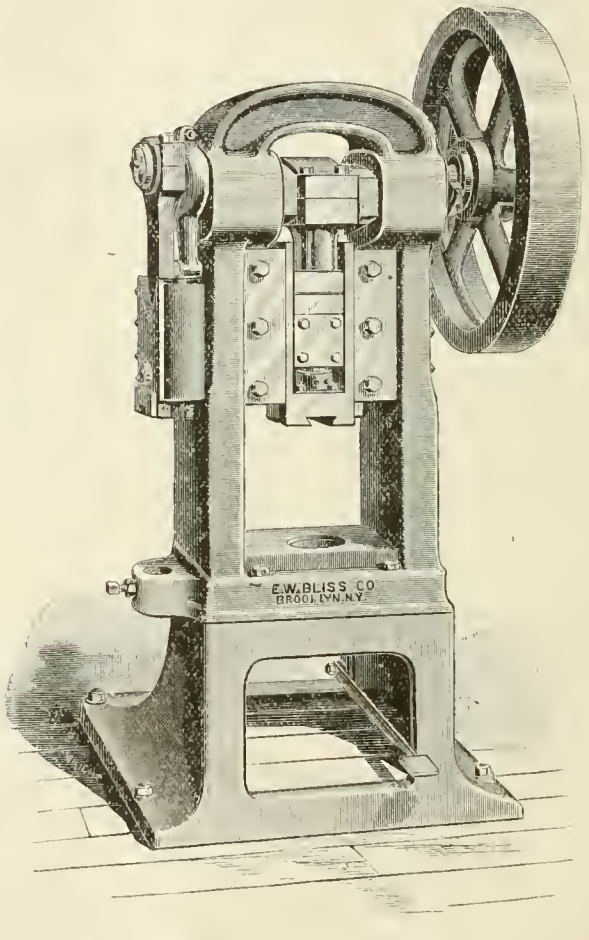
Advice to the Buyer.

In general, a few of the most important points to be considered by the purchaser of a press are as follows: 1. A great excess of strength and rigidity, that it may not break down or spring unduly from its normal shape. 2. Great length to the ram and ample surface of the proper shape upon its bearings and the parts of the frame which confine and guide it. 3. Accuracy of workmanship, especially in regard to the ram and its relations to the bed. 4. Durability, as secured by ample proportions in the smaller details and by sufficient bearing surfaces upon all the wearing parts, together with proper material, properly hardened where necessary. 5. All the clumsiness possible in the bed, ram and parts adjacent thereto, to give plenty of the anvil principle; that is to say, plenty of inertia to resist sudden blows without undue vibration. 6. Convenience of manipulation both in operation and adjustment. 7. Ample length of adjustment in the ram and other members having variable positions, together with plenty of die room in general. 8. Beauty and harmony of general design. This latter point may be sneered at as of no practical consequence by some non-esthetic Philistines whose souls are but part way civilized. Such men, however, must sometimes buy presses. For their financial benefit I will say that, in the long run, those machines which are the most artistically proportioned will, necessarily, have their materials so located in detail as to do the most good for the least money. They will, therefore, be the strongest and most durable.

It is calculated by the Mint Bureau officials that the gold production of the United States for 1893 will reach a total of $37,000,000 in value, as against $33,000,000 for 1892. Colorado alone contributes an increase of from $3,000,000 to $4,000,000, Montana, Arizona and New Mexico also showing gains. These figures bring up last year's gold production in this country to a point exceeding that of the bonanza period. The world's total gold production in 1893 is estimated to be more than $150,000,000, a gain of at least $12,000,000. These figures, in view of the fact that the output of silver last year was the smallest for many years, are reassuring as evidence that the gold supply will be entirely adequate for monetary purposes for some years to come.

Trimming Press for Drop Forgings.

The engraving represents a press of new design built by the E. W. Bliss Company of 17 Adams street, Brooklyn, and is intended for use in the forge shops where hot metal is to be trimmed. It is provided with the Bliss clutch and a patented adjustment in the slide, and has a supplementary slide in the side of its frame to be used in cutting off the work from the bar after it has been forged and trimmed. The press is of ample strength in all its parts and is usually provided with a fly wheel, as it is generally necessary to trim forgings very quickly and a high speed machine is essential. The machine shown has a 4-inch stroke, 4-inch adjustment; bed is 15 inches from bed to end of slide when up; distance between uprights is 22 inches. This machine carries a 900-pound fly wheel, the total weight being about 5500 pounds. The dimensions can be modified to suit special requirements if necessary. These presses can also be geared for cold trimming.



TRIMMING PRESS FOR DROP FORGINGS.

An important canal project, caculated to revolutionize lake traffic, is said to have the support of a number of New York, Chicago, Boston and London capitalists. The plan is to construct a canal, capable of accommodating the heaviest vessels, directly across the State of Michigan from the eastern shore of Lake Michigan either to Detroit or Toledo. Preliminary surveys of these routes have been made and the scheme pronounced by eminent engineers to be perfectly feasible. Either canal would be about 180 miles long, and would greatly facilitate the passage to the East of vessels from Chicago, Milwaukee and other Northwestern points, rendering unnecessary the present long water route through the Straits of Mackinaw, Lake Huron, St. Clair River and Lake, and down the Detroit River to Lake Erie.

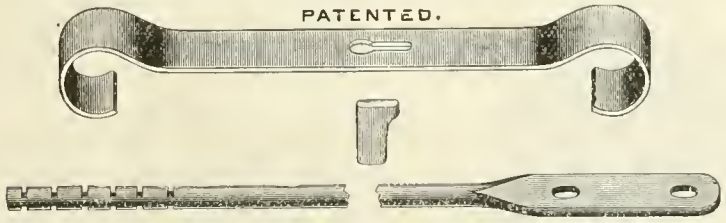
Statements received at the Department of Internal Affairs at Harrisburg, Pa., showed that the railroads in the State carried much more freight in 1893 than in 1892. The tonnage from the mining districts increased from 171,913,484 tons to 180,534,176; products of forests from 15,853,793 to 16,602,476; manufactures from 35,528,399 to 40,147,802; merchandise from 20,862,902 to 25,911,492. The tonnage of agricultural products decreased from 19,174,726 tons to 18,477,085. In 1892 the aggregate tonnage was 263,333,304 tons, and in 1893 281,673,031.

The first practical system of towing canal boats by electricity has just been inaugurated on the Bourgogne canal, says the New York *Marine Journal*, connecting the Seine and Saone rivers, France. The power is furnished by water falling from sluices at the two ends of the canal, and the current is made steady by means of storage batteries. The trolley system is used.

ROOFING AND CORNICE.

The Mundwiler Eave Trough Hanger.

We show in the accompanying illustrations the Mundwiler patent steel eave trough hanger made by Rhodes, Dickelman & Co., Forest, Ohio. Fig. 1 shows the different parts of the hanger. The rod after being bent is passed through the hanger and held in



The Mundwiler Eave Trough Hanger.—Fig. 1.—Parts of Hanger.

place by the key shown in the engraving, the slots at the end of the rod permitting adjustment to any fall or pitch. It will be seen by this arrangement that the trough is easily removed, as the key can be released without difficulty, and it can be taken down and painted without removing the hanger from the roof. Fig. 2 shows the Mundwiler patent clamp and slot hanger. The rod and hanger are fastened together by means of a key as in the case just described. The special feature of

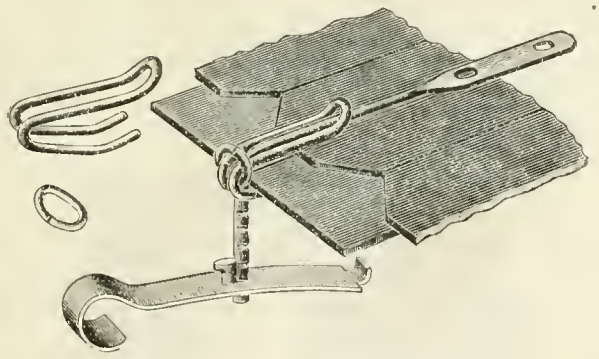


Fig. 2.—Hanger for Slate Roof.

this, however, is the device shown at the left, by means of which the hangers can be fastened to a slate roof without the use of nails, screws or burrs. The construction and application of this device is shown in the illustration.

Allen's Corrugating and Cornice Works.

An establishment which has grown remarkably within the past few years is Allen's Corrugating and Cornice Works, of which Thomas Allen is proprietor, at 422 and 424 West Randolph street, Chicago. The growth in the business compelled the addition of power some time since, and Mr. Allen is now enabled to turn out all classes of heavy work, such as are not easily attempted by those who operate hand machines. The shop is 180 x 50 feet, one story high in front and two stories in the rear, being very light and well arranged for receiving and shipping. It is well fitted with all appliances of the most approved character for corrugated and galvanized work.

The machinery comprises power shears for light or heavy sheets, geared and simple brakes, a very powerful crimper, a toggle machine for making standing seam roofing, skylight bars, V-crimped roofing, beaded ceiling, &c.; large corrugating rolls, weighing 12 tons; curving rolls, for curving arches of corrugated iron, &c.; power press for cutting skylight miters, cleats for roofing, &c.; power punch and shear for round, square and flat iron; machine for making curved moldings. The crimper above referred to is an exceptional machine, doing remarkably fine work. It takes a sheet 52 inches wide, and when turned out the sheet is as level as the top of a table, totally free from buckles or waves. The curved molding machine is one of the finest in the works. It makes curved moldings or cornices of any size, strictly true to profile and radius. The dies are very nicely adjusted, and the machine is controlled by a treadle, which regulates the stroke to the exact power desired. A brick machine is shortly to be installed for making steel brick in sheets 30½ x 60 inches, which is much larger than the capacity of most machines of the kind, thus reducing the amount of labor in putting the brick in place and making fewer joints when complete. Ample facilities are enjoyed for painting iron, while the storeroom will hold 500 to 800 tons of stock.

The second story of the rear portion is used as a warehouse, and forms a convenient location for paint agitators, &c., for the painting department below. In the front part of the shop is a good drafting room, well fitted up for laying out work, cutting patterns, &c. These works were equipped specially for making galvanized iron and copper bay windows, cornice work of all kinds, corrugated iron partitions, &c. This has been seriously interfered with by the action of the Chicago City Council, forbidding the use of galvanized iron work with wooden backing, and establishments of this character have thus been compelled to pay greater attention to other lines. The Allen Works will in the near future add a department for the manufacture of galvanized iron conductor pipe, gutters, &c. They will then cover all kinds of work in roofing, siding and finishing. Their facilities will enable them to handle the largest contracts. They do not limit themselves to local trade. Their business already covers a broad expanse of territory, but is principally in the West and Northwest.

They have just issued an illustrated catalogue of a number of their specialties. It is a neat publication of 16 pages, containing a great deal of interesting matter for roofers and cornice workers.

FLASHINGS.

Rhodes, Dickelman & Co., Forest, Ohio, have just put in their works a line of the latest and most improved machinery, and have at present a capacity for turning out 5000 feet of eave trough per day, though, they say, the facilities can be increased to 10,000 feet per day, if the trade demands. We hear from the firm that their prospects are very favorable, as a number of jobbers have become interested in their specialties. In addition to their eave trough hangers and roofings, sidings, corrugated iron, &c., they furnish galvanized conductor, elbows and other articles of galvanized iron.

David Lupton's Sons, 2611-2613 Coral street, Philadelphia, have recently added some new machinery to the cornice and skylight plant. They are now turning out hanging gutter, ridge roll and angle coping in 10-foot lengths. They are furnishing the Esterbrook Steel Pen Company with a sheet metal *fac simile* of their falcon pen for advertising purposes that is 3 feet long.

Some of the Pennsylvania slate quarries, which have been idle all the winter, are announced as about to resume work.

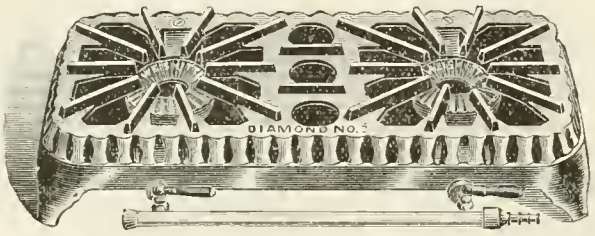
The large plant of the Porter Iron Roofing & Corrugating Company, which has been located at 101 West Front street, Cincinnati, is to be removed to Anderson, Ind. The final papers were signed on February 11 by the officers of the company and the officials of Anderson, in consideration of a small bonus and a factory site. Operations at Anderson by the iron works are to be commenced by May 1. The concern give employment to a large number of men

The American Roofing Company, St. Louis and Cincinnati, report a fair trade for the season. Their spring business will doubtless be large, as inquiries received by them denote that jobbers are not overburdened with stock and will shortly have to replenish. The Southern trade, which usually opens up about the middle of February, is a trifle backward, but promises to be heavy.

THE RETAIL STORE.

New Table Gas Stoves.

A. Weiskittel & Son, Baltimore, Md., have just brought out two new lines of gas stoves, each provided with two burners in the top plate. The larger size, offered under the name Fire King, is referred to by the manufacturers as of superior construction and possessing among other features a large flush top,



New Table Gas Stoves.—Fig. 1.—General View of Diamond Stove.

removable rings, air regulators, lever cocks and loose top burners, making a stove which, it is said, cannot get out of order and which enables the operator to readily keep it clean. The ornamentation is neat, nickel plate being judiciously employed, while the feet and edges of the top are highly polished. The feet are referred to as being especially attractive and ornamented with rich raised carving. The

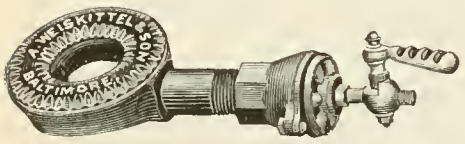


Fig. 2.—General View of Burner Employed.

second line, which is offered under the name Diamond, has been brought out to meet the demand for a low priced gas stove. It is, however, beautifully finished in nickel plate, and the manufacturers make for it very strong claims. We present in Fig. 1 a general view of this construction. The loose top burner, Fig. 2, which is employed in connection with these goods, is made entirely of

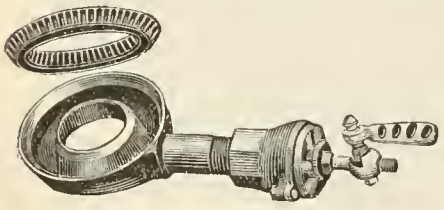
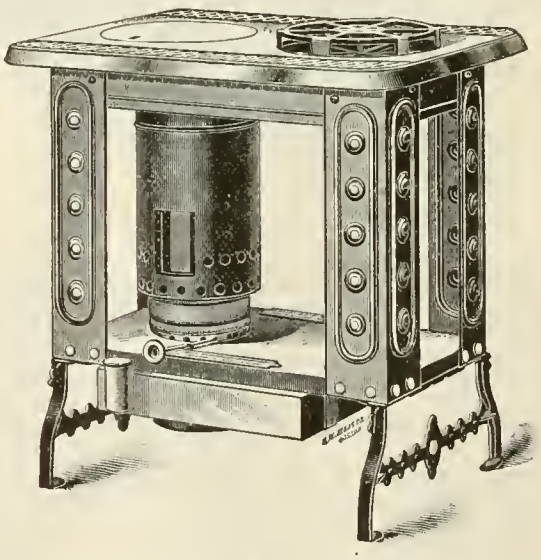


Fig. 3.—View of Burner with Loose Top Removed.

heavy cast iron, rendering it strong and durable. The makers state that it cannot get out of order, as there is nothing about it to burn or break, while it can readily be kept clean by simply lifting off the top, as indicated in Fig. 3 of the engravings, and removing any dirt which may have accumulated in the burner. The construction is such that any one can operate the stove, and all will readily appreciate the advantages claimed for the burner. The manufacturers point out that a perfectly clean burner will generate, with the same consumption of gas, a greater amount of heat than one clogged with dirt. The firm are now manufacturing five different lines of nickel plated gas cook stoves, for which many claims are put forth. The new catalogue which the firm have in preparation will be mailed to the trade in a short time.

Improved Ladies' Delight Oil Cooking Range.

Page Brothers & Co., successors to William Page & Co., Nos. 227-233 Cambridge street, Boston, Mass., have just brought out what they designate as the latest improved Ladies' Delight Cooker, embodying features of construction likely to interest the trade. The illustration which we present herewith represents one of the two sizes in which the range is offered, the other being double the capacity and provided with two burners. The feature to which special attention is directed consists of the manufacturers' patent central draft burner, made of seamless brass tubing and having a metallic covered non-conductor between the burner and tank, which prevents the latter from becoming heated by radiation. The tank holds 1 gallon and is made of polished brass, as are all those portions of the stove coming in contact with the oil. The stove here shown has two holes in the top, the latter measuring 16 x 20 inches. The oven occupies one griddle hole, while the other, which is directly over the flame, is available for other cooking purposes. The manufacturers refer to this stove as absolutely safe and odorless, neat, clean and easily cared for and does not smoke or draw up.



Improved Ladies' Delight Oil Cooking Range.

MEMORANDA.

A. B. SCHOONMAKER, who has been with the firm of E. F. Berean & Co. for about five years, has purchased the tin and stove business of W. H. Newman, at Marlborough, N. Y., and will hereafter conduct that business himself.

W. C. VANDENBERGH & Co., Blue Island, Ill., have just opened a large hardware and stove store in that place, putting in a complete line of Peninsular goods, which they have arranged to handle exclusively.

W. B. HIRST is about to open a stove and tin store at South Charleston, Ohio, where he will also be prepared to do all kinds of roofing. Mr. Hirst will be glad to receive catalogues from manufacturers in his line.

Final action has been taken by the trustees of the Brooklyn Bridge in relation to the terminal improvements in Brooklyn. The plan for extending the bridge terminal to Tillary street and the erection of a station at that point, involving an expenditure of from $3,000,000 to $4,000,000, was abandoned, and the plans prepared by the bridge engineers a year ago accepted. The total cost will not be more than $300,000. It is probable that the cars on the bridge will be lighted with Pintsch gas, recent experiments with that system having proved satisfactory.

STOVE TRADE NOTES.

The New York City Stove Trade.

The stove trade in New York City and nearby towns, considered as a whole, may be set down as dull, with a slight improvement in February over what it was in January. The present demand for coal cooking stoves of the portable variety is and has been so small that orders for such stoves do not resemble the usual forerunners at this time of the year of an approaching spring trade. There is nothing in the demand to base any hopes of a satisfactory spring trade on, so far as those particular stoves are concerned, and it is still so small as to imply more the need here and there of a stove to replace one that has actually broken down and fallen to pieces beyond the possibility of repair. There is not enough in it to afford an analysis, based on sizes, varieties, quantities and grade, and compute its probable growth and character, or to indicate that the people are disposed or able to buy for any other reason than actual need.

If the people are too poor or too afraid to buy until practically driven to do so for the want of something to build a fire in, it is plain that the stove business, which for its profitable magnitude depends so largely upon purchases made in deference to fashion, pride, or the desire for greater conveniences, will continue to be restricted until confidence is restored to promote buying by those who have the means, and money is let out in other avenues to furnish employment to idle men. In this connection, and as affecting to a considerable extent the city trade, much depends on the building business hereabouts. In this line some improvement is observed, and it affords the only ray of hope of spring business, not only in the cooking and heating apparatus used in new buildings, but in portable stoves as well, and those concerns who manufacture or deal in both classes of goods will be benefited to a double extent. The severe weather during the past month has hindered progress in this line, and postponed the benefit to the stove business that always arises from building activity. Every mild day has brought inquirers from among the builders or agents of mortgagees, into whose hands much unfinished property has recently been and continues to be turned back, as to plumbing, hardware, roofing, ranges and heaters, only to be nipped in the bud by extreme cold weather or snow following. Signs of strong activity even in this line are absent, as loans are still made with a sparing hand, credit for material is only conservatively extended, rapid transit is still unsettled, and affairs at Washington uncertain, so that the stove business from any point of view seems not to be destined soon for a recovery from the depression into which the whole trade and commerce of the country have settled.

While all this is true as based upon present signs there may be more business in March than any of us dream of at present or that there seems any reason to expect. Traveling salesmen are just about leaving town, two weeks late, as a rule, and their sales and reports after getting fairly to work may contain more encouragement than is looked for. Certain it is that much money is withheld from circulation by those who can well afford to spend it, and those who have had continuous employment ever since the cry of hard times was first heard have saved every cent they could for fear of losing employment, and these people must get "tired out."

Man is not prone to long indulge gloomy forebodings or to long continue the practice of self denial. Again, the winter, which everybody has dreaded, is nearly ended; the crisis is past and the hopeful season of the year is at hand, when it may reasonably be expected that many who got through better than they anticipated and saved money besides will make purchases long delayed and help to swell the amount of money in circulation and create a vacuum in the market, which factories, foundries and mills will quickly respond to fill. SIFTER.

An Ideal Gas Stove.

In a recent number of the *Gentleman's Magazine* Lynn Cyril D'Oyle publishes an article on the use of gas for cooking and heating, in which he discusses at some length the report of the *Lancet* Commission which was reprinted in *The Metal Worker*, December 23 and 30, 1893. From Mr. D'Oyle's article we quote the following account of an ideal gas stove:

I would have gas fires specially constructed upon what is my ideal of perfection. The stove would be supplied with air sufficient to insure the complete combustion of the gas consumed from outside the apartment, either through the floor or from an outer wall —not to avoid the cock and bull theory about burning up the oxygen, but so that any draft along the floor would be impossible, and to insure all the ventilation being from the top of the apartment. I would have the air and the gas supply so contrived that both were heated to a very high temperature before coming to the point of ignition—of different construction, but on exactly the same principle as the recuperation lamp—a system by which the best heating effect is to be obtained, and one which seems to have been neglected by stove makers. Would not this also insure a noiseless burner? My fire should be atmospheric, and packed with clay balls to give a cheerful glow and to impart as much radiant heat as possible. The flue should be from the top of the stove, of sufficient size only to carry off the products of combustion, and going straight up to the ceiling, where it would run between it and the floor above, and join into the flue coming from the ventilating light. It would then draw the vitiated air of the apartment away through the rose over the ventilating light, and, in fact, would do exactly the same duty. By this means practically the whole heating power of the gas consumed would be utilized upon the air of the room, and we should combine the three greatest things to be attained—the full calorific value of the fuel, a hot, glowing, cheerful fire, and a most excellent system of ventilation, which might add a span to life and be a material aid to comfort. The flue from the stove to the ceiling might be covered with art porcelain or other ware, so that it would be really attractive. But in any house not specially constructed such a contrivance would probably be more efficient than any other method, and when not convenient (or considered too expensive) to put in a shaft, the flue could be carried up nearly to the ceiling line and then through into the chimney, having a ventilating rose around it. The damper at the bottom of the chimney would, of course, be closed. The only disadvantage to this would be that in time the ceiling would be discolored above the bend, not from any products of the gas, but for the same reason which causes a similar effect over any steam or hot water pipe.

Cooking and Heating by Electricity.

Central Electrical Heating Co., Havemeyer Building, 26-28 Cortlandt street, New York, manufacturers among other things of a large number of articles for culinary, laundry and heating purposes by means of electricity, have fitted up a room adjoining their suite of offices as a kitchen and dining room. This is in charge of a competent cook, who prepares every day a meal for the office staff and such as are desirous of seeing a practical demonstration of this method of preparing food or heating rooms. The implements made by this company are so arranged that to operate them it is only necessary to connect with any electric light wires in any room in a house. There is no danger from shock, the current admitted to houses being insufficient to do harm. Among other things the company manufacture Ranges with one or more ovens, suitable for roasting, baking, &c., Broilers, Toasters, Coffee and Tea Pots, Stew and Frying Pans, Tea Kettles, Laundry, Hat and Curling Irons, Glue Pots, Chafing Dishes, &c. For ordinary purposes, aside from space heating, it is stated this method competes successfully with coal at $6 per ton. Unless water power is available, the entire heating of buildings, &c., at the present rates for supplying electricity is still a luxury. There are, however, residences in this city and Brooklyn where no coal has been used for two years for cooking, heating, lighting and laundry purposes. One point emphasized is that there is no dirt from coal or ashes, the current can be turned on or off instantly and the intensity of heat graded by simply turning a switch. In warm weather the heat can be discontinued when through with, while in cold weather a heating apparatus can be quickly connected in any room wired for electric lighting, for the purpose of supplementing the supply of heat, as in a nursery, dining room, library, sick room or wherever

needed. This method does not vitiate the air of the room by absorbing the oxygen in it, as when gas, oil or coal are used. They also make Disk Stoves for light work, to be used anywhere. These are a few inches high and about 12 inches in diameter. When the utensils or heating apparatus are not in use the expense is stopped by cutting off the current, meters measuring what is used, the same as gas. This company have recently fitted over 2000 railroad cars with their heating apparatus, 200 of which belonged to the Atlantic avenue trolley system in Brooklyn.

ODD PLATES.

The Cincinnati Steel Range Company of Cincinnati, Ohio, have just brought out a new line of low priced wrought steel ranges designed for family use. Two sizes and three styles are now made. The goods are designed, we understand, to meet the demand for a first-class family size wrought steel range, approximating in cost the ordinary cast iron construction. The new line is well proportioned, massive in design and tastefully decorated with nickel. The arrangement of parts is such that coal or wood may be used in the same fire box. The manufacturers are confident that the new line of goods will meet with favor at the hands of the trade.

The pattern storehouse of Hess, Snyder & Co., Massillon, Ohio, was seriously damaged by fire on Tuesday, February 20. The conflagration is thought to have been the work of an incendiary, and resulted in a loss which at latest advices was estimated at $5000, partially covered by insurance.

C. W. Trotter & Son, 46-48 North Clinton street, Rochester, N. Y., send us a neat catalogue, with folders, relative to the bake ovens which they manufacture. These goods, we understand, are intended to take the place of a brick oven, being provided with three walls, outside, inside and middle partition, and are lined with asbestos or mineral wool, which, with an air space, makes five thicknesses. The ovens are made single and double and are intended for using coal or wood as a fuel. The manufacturers make special reference to their mechanical construction, durability, cleanliness and insulation of the walls. The Trotter galvanized steel bake oven is designed for bread, meats, pastry, &c., and for use in bakeries, hotels, asylums, colleges and all public institutions. They also refer to their patent dry air refrigerator and to the fact that cold storage rooms and refrigerators are constructed to order. The firm handle as specialties furnaces, ranges, gas stoves, refrigerators, bake ovens for public institutions and hotel supplies.

According to recent issues of local papers the State Department, at Harrisburgh, issued on Monday, February 19 a charter to the Chicago & Erie Stove Company of Erie, Pa., capitalized at $200,000. The directors named are William H. Whitehead, Charles E. Shirk and Frank C. Whitehead.

The Weir Stove Company of Taunton, Mass., closed their works on the night of Thursday, February 15. The policy of the company in the past has been to run their shop, when in operation, full capacity, and as they were getting on hand more goods than appeared necessary in view of the depression in the trade, they shut down without naming any time for resuming. They hope, however, that the shut down will be for a short period only, depending largely upon the condition of trade in the immediate future. They expect, however, that early in the month things will be in shape to put their men to work in all departments.

The Schneider & Trenkamp Company of Cleveland, Ohio, have issued an exceedingly attractive catalogue and price-list relating to their lines of gas stoves made under the name Reliable. It is a well arranged pamphlet of 70 pages, neatly printed on a good quality of paper and bound in colored paper covers carrying a side title in old gold. The engravings are well executed, and show to advantage the various styles and sizes in which the Reliable goods are made. This volume is the fifth annual gas range catalogue which the company have brought out, and in it the statement is made that the manufacturers are offering seven distinct lines of ranges "which are unquestionably leaders in the gas stove world today." Among the improvements which the company have made for the coming season may be mentioned the addition of an entire line of ranges with side broilers and a complete line with half low water heaters. In response to a call which they have received from various sources during the past season, they have also added an entirely new line of cheap ranges. The opening pages of the catalogue are given up to a number of testimonials from those who have used the company's goods, following which the Reliable gas ranges are illustrated and described. The goods are well made throughout, embodying the latest features of convenience and utility, and are ornamented in a manner pleasing to the eye. Attention is also given to Reliable junior gas stoves, or hot plates, burners, furnaces, sad iron heaters, broilers and toasters, stew pans, gas radiators and bake ovens. A telegraphic code is presented for the use of dealers desiring to order goods by wire.

A sign in front of the building now occupied by the Thatcher Furnace Company, New York, gives notice that they will move to 240 Water street about May 1.

Eugene Belson, at the recent expiration of the partnership of Faith, Belson & Co., stove dealers, at Philadelphia, withdrew from the firm.

F. M. Borden & Bro., Philadelphia, welcomed F. M. Borden home from a sojourn in Florida last week, and after a very rough sea voyage stoves and refrigerators were a very welcome sight. He says that no section has been so thoroughly drummed recently as Florida, as a result of the "fight or fizzle" which came off at Jacksonville.

L. B. Cress is on a trip through Pennsylvania representing the Leibrandt & McDowell Stove Company of Philadelphia, and disposing of Farmer Girl cooks and the Victor Cook ranges.

Reeves & Horner, 45 North Second street, Philadelphia, Pa., are issuing a trade price-list of their Globe oven for oil, gas and gasoline stoves. The doors are stamped with designs from dies in their presses and the ovens have a double stayed corner and some have a Russia iron top. The ovens are finished on the inside with soft steel and are said to be superior bakers. With this circular they send a list of the stove sundries they handle and a list of the manufacturers whose repairs they carry in stock. They have the sales agency for Philadelphia of March-Brownback Stove Company of Pottstown, Pa., Schuylkill Valley Stove Company of Spring City, Pa., Raymond & Campbell Mfg. Company, Middletown, Pa., and have recently been made the Eastern sales agency and distributing house of the gas goods of Geo. M. Clark & Co., Chicago, Ill.

The Front Rank Steel Furnace Company of St. Louis, Mo., report a good demand for their Front Rank steel furnace. Four furnaces have recently been shipped to Stratford, Ontario, and a number of others to various points in Canada. The makers are experimenting with a hot water heater, which will shortly be ready for the trade, and which promises to create a sensation, as regards economy and heating capacity.

The Stockhoff Heating Supplies Company, St. Louis, Mo., are issuing a batch of advertising matter to the trade, consisting of vest pocket memorandum book, circulars, &c. This advertising matter refers to the fact that they are agents for the Bostwick steel lath and also for the product of the Barbee Wire & Iron Company.

The thirty-fourth meeting of the Foundrymen's Association will be held at the Manufacturers' Club in Philadelphia on Wednesday, March 7, at 8 o'clock p. m. There will be a discussion on W. J. Keep's paper entitled "Foundry Chemistry," as to whether chemistry or the ordinary practice used by foundrymen in mixing their irons, &c, can better be depended upon for foundry practice. A number of analytical chemists are expected to be present at the meeting to take part in the discussion.

The annual meeting of the stockholders of the Chattanooga Stove Company, Chattanooga, Tenn., was held Wednesday, February 14 the old Board of Directors being elected, as follows: W. W. Baldwin, H. J. Baldwin and M. B. Clark of Cleveland, Ohio; C. H. Baldwin of St. Louis, and G. W. Farrington of Chattanooga. The report of the condition of the company by Manager G. W. Farrington was regarded as very satisfactory, the company having enjoyed a fairly prosperous year. The works are reported in full operation and giving employment to nearly 100 men.

The stove plant of the Abram Cox Stove Company, situated at Lansdale, Pa., resumed operation on February 23 with a force of 100 men.

John A. Duncan, receiver of the stove works of Duncan & Masters, Eighth and Santa Fé streets, Kansas City, Mo., has recently filed his report with Judge Henry. The statement shows that he has received in cash $9917.04 and disbursed $9137.73, including a dividend of 40 per cent. paid to creditors.

The Scranton Stove Works announce under recent date that owing to the growing importance of their Western business they have arranged with Judson A. Tolman to give up his retail trade in Chicago and devote his entire time to the wholesale business. The company state that by reason of a well equipped modern stove plant erected in 1893 and with an increased stock in Chicago they will be able to promptly supply the wants of their Western customers with "a line of stoves and ranges second to none." Mr. Tolman's headquarters in Chicago are at 32 Van Buren street.

P. C. DeVol, Council Bluffs, Iowa, offered a prize for the best poem on Garland stoves and ranges. The successful verses describe very cleverly many of the merits of these well-known goods. The conclusion of the story is as follows·

So, now, all you people who want a good stove,
Stay right here at home and no longer rove;
For the stove that is known as the best stove of all
Is the "Garland," sold only by P. C. DeVol.

The Glazier Stove Company, Chelsea, Mich., issue a notice to the trade, under date of February 19, that their warehouse and offices were completely destroyed by fire on February 18. They state, however, that this will interfere with them but slightly in supplying their customers with the B. & B. stoves, as their factory and unfinished product are unharmed. They are running full force and turning out goods at a rate that will soon enable them to fill all orders promptly.

J. B. Oldershaw of Baltimore, Md., has issued under date of March 1 a notice to the effect that the stove and furnace business established in that city by him in the year 1859, and continued for the past 35 years, will hereafter be conducted under the name of the Rapid Transit Stove & Furnace Company, located at 628 North Eutaw street and 400 and 402 Druid Hill avenue.

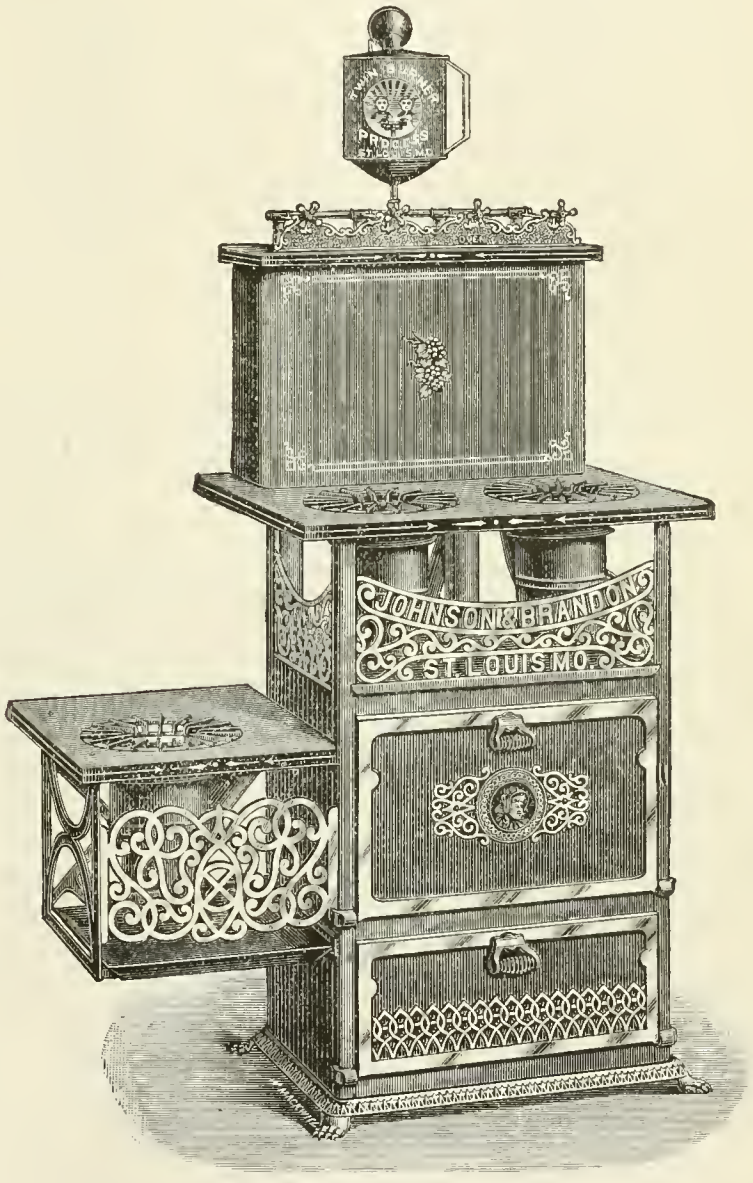
"Monarch Gas Stoves," is the title of a very neat catalogue of over 30 pages, which reaches us from the Baxter Stove Company of Mansfield, Ohio. The printing is upon tinted paper, the text appearing in two colors, while the engravings are in black. The binding is in colored covers, and the side title is embossed in old gold letters. The frontispiece consists of a bird's-eye view of the company's works at Mansfield, facing which is a group of portraits consisting of Thomas Baxter and his seven sons. The goods illustrated are made under the generic name Monarch, and comprise numerous styles and sizes. The goods embody the latest improvements and are constructed in a manner giving good results in operation. One feature of the Royal Monarch stove to which particular attention is invited is an iron casing added to the end step, within which is a portable reservoir made of cast iron and either porcelain lined or lined with 14 ounce tinned copper. Attention is also invited to the Monarch, which is offered in Nos. 84, 94, 5 and 44. Under the same name is offered a line of table stoves consisting of Nos. 4, 42 and 43, while Nos. 53, 55 and 58 are hot plates. The closing pages of the catalogue are devoted to the Monarch gas heater, Monarch broiler, steam cooker, ovens and fittings.

The office and salesroom of the Richardson & Boynton Company, 84 Lake street, Chicago, has been moved to the second story of the same building.

Press dispatches from Bloomington, Ill., under date of February 25, are to the effect that early on the morning of the day named fire broke out in the works of the Bloomington Stove Company in that place, entailing a loss of several thousand dollars. The works were practically destroyed, and all the patterns, together with a large amount of new work, seriously damaged. It is stated that although the works had been shut down for several weeks it was the intention of the company to resume operations on the morning of Monday, February 26, with a full force of hands. The fire is supposed to have been of incendiary origin, but the loss is fully covered by insurance.

Twin Burner Process Cabinet Stove.

We present herewith a general view of what is known as the Twin Burner process cabinet stove, which is being introduced to the trade by the Twin Burner Stove Company, Johnson & Brandon, proprietors, 2020 and 2026 Walnut street, St. Louis, Mo. The stove is referred to by the manufacturers as being strong and substantially constructed, finished in a first-class manner, and the decorative features neat and effective. The hot air and vaporizing tubes extend through the top of the stove inside in such a way as to protect them while at the same time securely bracing them in position. They are connected with removable cast iron couplings which are easily taken apart, so that the vaporizers may be taken out and cleaned. These vaporizers are construced of perforated brass and the cone seats of cast iron. The cone seats are provided with wrought iron flanges, so as to protect the burner drums from heat, grease and dirt, which heretofore have been the cause of the drums either burning out or rusting off at the top. The manufacturers refer to this improvement as rendering all hot air conductors indestructible and as worthy of important consideration on the part of the trade. The burners are so fastened by a bolt as to be easily taken apart while the needle points are of pure German silver wire, making them safe from damage by corrosion or rust, and insuring a steady drip. The cone rests and cone caps are ground to an even bearing to fit air or gas tight and have no packing. This is a feature which the manufacturers claim is embodied exclusively in the Twin Burner process cabinet. The stove is provided with sight feed tubes, and the oven with double burners, a feature strongly urged by the manufacturers. The stove is provided with two burners on top and a third in the step at the left. The manufacturers refer to the Twin Burner process cabinet as possessing large cooking capacity and as occupying but small floor space. In the catalogue which the company have issued for the season of 1894, this stove is illustrated in its various styles and sizes, as are also the Twin burner step stove and junior stoves.



Twin Burner Process Cabinet Stove.

TRADE REPORT.

The Iron Market.

Reports from Pittsburgh indicate that there have been large sales of Lake Ore to furnaces in that district. It is not clear to what extent the purchases alluded to involve merely a readjustment of prices on Ore not delivered on last season's contracts. The largest producer in the Pittsburgh district is credited with having bought 800,000 tons last week, in addition to 200,000 tons of Pewabic Ore bought earlier. Since the same concern was credited early this year with carrying 500,000 tons the purchase looks very heavy. It is estimated by good authority that the Lake mining companies have contracted to date for about 1,800,000 to 2,000,000 tons.

The Pig Iron markets are pretty quiet, so far as Foundry grades are concerned. Increasing demoralization characterizes the Southern producers, who have a tremendous fight on their hands against the cheaply produced Irons made in the districts which run on Lake Ores and Connellsville Coke.

We note a sale of 5000 tons of warrants to English parties, which carries the total foreign holdings close to 45,000 tons.

It looks as though some one were eager to create the impression that Wire Rods were very scarce. Reports are conflicting, but thus far there is enough material to go around comfortably.

Negotiations for a shipment of 1000 tons of Scrap Iron to Glasgow, England, are reported to have fallen through.

Pig Iron.—Current business is light, and competition for orders coming up is very sharp, Eastern Pennsylvania and Hudson River furnaces crowding the Eastern market. A lot of about 1200 tons of No. 2 Northern Iron was sold for delivery near Boston at $12.15. Albany, Troy and the entire northern part of the State is the battle ground of the Buffalo producers, who are making prices below those at which other Irons can be laid down. From the South come reports of increasing demoralization. It looks as though the Southern Iron which is being driven back out of Western territory by local Irons will exert increased pressure upon the seaboard markets. During the past week a sale has been made of 5000 tons of warrants to English parties, thus following up sales of 3000 and 3600 tons recently made. It is estimated that from 40,000 to 45,000 tons of warrants have been taken thus far for English account. Quite a number of small Cast Iron Pipe contracts have been placed lately, among them being Tonawanda, 1400 tons for New York at $19; Yonkers, at $21.35; Pittsfield, at $21.40, and Springfield, at $22. A gas company in this city is in the market for 17,000 pieces. It is reported that this company will in all require over 70 miles of Pipe. We quote standard brands $13 @ $13 50 for No. 1; $12 @ $12.50 for No. 2, at tidewater. Southern Iron, same delivery, $12.75 @ $13.50 for No. 1; $11.25 @ $11.75 for No. 2; $11 @ $11.50 for No. 3; $11.25 @ $11.75 for No. 2 Soft, and $11.75 @ $12 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10 50 @ $11.

Advices from Philadelphia intimate that the demand for Pig Iron in that market is fairly in line with the supply. It has not increased as rapidly as was hoped, but it holds its own, and there is some reason to believe will begin to show improvement in course of the next three or four weeks. Prices are very low, and while they are pretty well held, there is not much chance of improvement until consumption reaches larger proportions than at present. Prices are more uniform than they have been for a long time past, 50¢ ℔ ton being about the extreme range in any of the grades; that is to say, $13 being about a very inside figure for No. 1 Foundry, and $13.50 the extreme outside. General quotations for Philadelphia and equivalent points are about as follows:

No. 1 Foundry	$13.00 @ $13.50
No. 2 Foundry	12.25 @ 12.75

In the Chicago market a fair volume of business is reported in local Iron, but the large majority of transactions have been in small lots, with but a slight sprinkling of good sized contracts. Sales of Southern Iron are still in small quantities only and now run mostly to Nos. 1 and 2 Soft, which are wanted as a mixture with the harder Northern Iron. Lake Superior Charcoal is very quiet with but little inquiry. Quotations are given as follows, for cash:

Lake Superior Charcoal	$15.30 @ $15.50
Local Coke Foundry, No. 1	12.00 @ 12.50
Local Coke Foundry, No. 2	11.50 @ 12.00
Local Coke Foundry, No. 3	11.00 @ 11.50
Local Scotch	13.00 @ 13.50
Ohio Strong Softeners No. 1	13.50 @ 14.50
Southern Silvery, No. 1	..... @ 12.50
Southern Silvery, No. 2	..... @ 11.75
Southern Coke, No. 2	11.50 @ 11.65
Southern Coke, No. 3	11.00 @ 11.50
Southern, No. 1, Soft	11.50 @ 11.65
Southern, No. 2, Soft	11.00 @ 11.50
Tennessee Charcoal, No. 1	16.00 @ 16.50
Tennessee Charcoal, No. 2	..... @ 15.00
Alabama Car Wheel	18.50 @ 18.65
Jackson County Silvery	15.00 @ 16.00
Other Ohio Silvery	13.00 @ 13.50
Coke Bessemer	12.00 @ 12.50

The same discouraging condition of the Pig Iron trade noted for the past two or three weeks continues in the Pittsburgh district, and prices are reported as showing a weaker tendency, under the influence of recent sales of Ore on the basis of $2.75, Cleveland. The market continues to be characterized by purchases of hand to mouth character, no large blocks being in negotiation and none are expected until the market is more settled. Foundry Iron is in fair demand, inquiries being better than for some little time past. We quote the market as follows:

No. 1 Foundry	$12.00 @ $12.25, cash
No. 2 Foundry	10.75 @ 11.00 "

The general feature of the Southern Pig Iron market is weakness, and it is evident that round lots of Southern Coke Iron could be bought at lower prices; there have been sales of 2000 tons No. 2 Soft Foundry Iron at $7, f.o.b. Birmingham, and for No. 2 regular it is said that $7.25 has been shaded; in fact, the whole market for Southern Foundry Coke Iron is so much demoralized that there appear to be no settled prices, but it is strongly asserted that a reduction of fully 25¢ ℔ ton could be obtained on all grades. There is rather more demand for small lots from the jobbing foundries, the orders being more frequent and for increased quantities, more frequently running up to 100 to 200 tons, but the aggregate volume of business is still so small as to discourage furnacemen and their agents. There is not much demand for Charcoal Iron, but the better qualities of standard Car Wheel Iron are firmly held. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$11.00 @ $11.25
Southern Coke, No. 2	10.00 @ 10.25
Southern Coke, No. 3	9.50 @ 9.75
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.25 @ 14.50
Lake Superior Coke, No. 1	13.00 @ 13.50
Lake Superior Coke, No. 2	12.00 @ 12.25
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.50 @ 14.00
Tennessee Charcoal, No. 2	12.50 @ 13.00
Standard Southern Car Wheel	16.75 @ 17.75
Lake Superior Car Wheel and Malleable	16.50 @ 17.00

Metal Market.

Pig Tin.—Prices have undergone a further decline in the wholesale market, but the change is not felt in small lots. The weakness may be attributed chiefly to London depression caused by heavy European stocks of Tin, the unsettled condition of the Silver market and of Eastern exchange. In any event there have been no distinctly "bearish" local features, nor have there been any signs of unusual pressure to sell.

Copper.—The fairly large business referred to last week has had no visible effect upon the general market. In any event nothing more than routine trans-

actions have come to notice, and the almost invariable report is that both home trade and export demand are extremely tame at the moment, while prices remain stationary.

Pig Lead.—Business has been very moderate in this market. Negotiation has also been tame. In short, dullness stands out prominently as the conspicuous feature. In prices in the wholesale market hardly any change has taken place, while in small quantities quotations remain the same as last week.

Spelter.—Dealings in this quarter have been very commonplace. The demand has not turned for the better. The offering has reflected no change in the attitude of sellers. In fact, the market has remained flat, showing no response to late reports of contemplated combination of smelters. In the jobbing trade, however, there is a slight stiffening in prices.

Tin Plates.—In some lines of Plates for prompt and early delivery business has increased slightly, but no signs have appeared of anything in the way of general improvement. This tendency toward a stronger market is noticeable particularly in Coke Tins, other kinds of Plates not being appreciably affected.

A London dispatch to *The Iron Age*, under date of February 28, refers to the market as follows: Business in Tin Plate has been moderate. Buyers seem still to limit orders to immediate wants, although making more inquiries. The impression is that business is likely to continue until buyers offer better prices, since makers are more disinclined to do business at a loss. Several makers have refused to enter orders at prices that were accepted a week ago. Black Plates are held at somewhat higher prices. The Pontymister workmen have given notice of termination of their contracts, owing to a dispute on Saturday with the owners. Liverpool prices are quoted as follows:

IC Charcoal, Alloway grade.....12/3 @ 12/9
IC Bessemer Steel, Coke finish. ...10/6 @ 11/
IC Siemens " " " .....11/ @ 11/3
IC Coke, B. V. grade, 14 x 20.....Nominal.
Charcoal Terne, Dean grade.....10/3 @ 10/9

Sheet Iron.—Writing of the Western market our Chicago correspondent says: Manufacturers of Black Sheets are soliciting business more keenly than ever, and exceptional inducements are being offered to buyers to place their contracts for the season at this time. The business in Galvanized Iron is extremely dull, as consumers are holding off in the expectation that prices may go lower. This is rather doubtful, as manufacturers are now discriminating on the list and some are refusing to take any business whatever on heavy guages. They claim that it is a waste of time and trouble to galvanize Sheets, and therefore would prefer to sell them as Black Sheets, rather than put them through the galvanizing process.

Chicago Report.

Scrap.—Business is quiet in Old Material. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	...
Machinery Cast	6.00	...
Malleable Cast	5.00	...
Stove Plate (free of burnt)	4.00	...
Burnt Iron and Grate Bars	3.00	...
Sheet Iron and Hoops	2.00	...
Plow Steel and Breaking Stock	4.00	...
No. 2, such as Shovels, Hoes, &c	3.00	..
Old Boilers—whole (Iron)	3.00	...
" (Iron)—cut in single Sheets and Rings	5.00	...
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Dealers report a much better trade. Coal has again begun to move, as domestic stocks are being exhausted by the continued cold weather through February. Carload lots of 12 net tons or over are nominally quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.8'

THE STANDARD TURNING WORKS, Cambridgeport, Mass., send out circulars announcing that they are preparing to do all sorts of work in the turning line, making every variety of Handles, or anything of a similar nature. They have a large stock on hand and are prepared to do work in common and fancy goods and ivory. Accompanying their circular they send out a box filled with a miscellaneous assortment of samples. These include a wide variety of turned Handles made from different sorts of wood and finished in various ways by staining, polishing, enameling, &c.

NOTICE IS ISSUED to the trade from Yonkers, N. Y., under date of February 13, by Joseph M. Stoughton, receiver of the W. F. Washburn Brass & Iron Works, that the works are now running under an order of the Supreme Court.

FRANCIS I. MAULE, 28 Cheatnut street, Philadelphia, Pa., sends out a pamphlet of interest to advertisers. It is gotten up in the original style characteristic of Mr. Maule's work.

CONDITION OF THE

Hardware Trade.

FEBRUARY CLOSED with only a moderate volume of current business, the aggregate of the month's trade, however, having been fair. It is hoped that trade will assume a more normal activity during March. Prices are without important change, being somewhat better on such leading goods as Barb Wire and Wire Nails, owing in part to concerted action by the manufacturers, and also to a reaction from the extremely low prices which have been ruling for some time. In most lines, however, the market is not especially strong, and manufacturers are showing a disposition to shade prices to secure business. There is some complaint in regard to collections, but on the whole they are referred to as fair.

Advices from Chicago.—The character of the Shelf Hardware trade is changing to some extent. The demand is running a little more to straight Hardware and less to staples than has been the case from the beginning of the year up to a very recent date. Merchants are more closely examining into the character of their stocks, and finding that they need Builders' Hardware and other shelf goods for spring business are ordering a little more freely in this line. The demand for staple goods and seasonable goods has perhaps fallen off in about the same proportion, so that the volume of business can hardly be said to have improved. The change toward straight Hardware nevertheless is appreciated by the jobbers, who are anxious to see considerably more movement in this branch of their trade, from which better remuneration is ordinarily obtained. The Heavy Hardware jobbers are feeling serious results from the recent heavy snowstorms and the cold weather which followed. Their trade has fallen off, and the shrinkage in the volume of business has at the same time been attended by efforts of sellers to increase business by offering concessions in prices. The only effect thus far has been to demoralize buyers and cause them to defer purchasing in the hope that they may be able to do still better. The low prices made are affecting such articles as Carriage Bolts, Machine Bolts and other staple goods of the same class. Prices on iron and steel are dropping, and it is not yet apparent that bottom has been struck.

Notes on Prices.

Wire Nails.—The volume of business is fair and with the orders booked during the past month or two the manufacturers will be well occupied for some time to come. In the matter of price the market is in excellent condition and has a firm tone. Manufacturers are adhering to the quotation of $1.10 for carload lots at factory, and

in some cases are naming a somewhat higher figure. The good understanding which exists between the manufacturers of Wire Nails and Barb Wire contributes not a little to the strength of the market, especially in view of the action which has been taken in regard to the raw material. At the present time it is thought by some well informed parties that existing quotations will be not only maintained but that slight advances in the near future are not unlikely.

Advices from Chicago.—Low prices on Wire Nails now appear to be a matter of the past. Present indications favor an advance in the near future, depending on the disposition of the leading manufacturers. They have gained absolute control of the situation in some essential particulars. They have in connection with the Barb Wire manufacturers bought the surplus product of the active wire rod mills up to July 1 and have in addition succeeded in removing some competition in the Wire Nail trade, which might have proved annoying during the next month or two. It is likely that some large merchants who were resting in the belief that they had secured very low contracts on Wire Nails may suddenly find that these contracts are with parties who will not be able to fill them. The replacing of such contracts on the market under present conditions can hardly fail to have a decidedly stiffening effect on prices. The actual volume of business within the past week has not been large, but inquiries were good and considerbale trade is in sight which must speedily be closed. Manufacturers' prices are continued at about $1.20 to $1.25 Chicago, while small lots from jobbers' stocks are selling at $1.25.

Cut Nails.—There is little new to report in the Cut Nail market. The volume of business is fair, but not heavy. Prices are, however, quite well maintained on the basis in the East of $1.05 for carload lots on dock, New York, the manufacturers adhering strictly to their policy recently adopted of quoting only prices for Nails delivered. The Western market continues steady at $1 to $1.05 at mill. The price from store in New York is firm at $1.15.

Advices from Chicago.—An excellent week is reported in Cut Steel Nails. Good orders have been received from the greater part of the Northwestern territory, as well as in other sections which are not usually regarded as tributary to this particular market. While the volume of business in Cut Nails cannot be said to show remarkable growth, at the same time it is of a character to give considerable encouragement to the local manufacturers. Outside factories are doing very little at present in this locality on account of the close prices made here. Quotations are continued at $1.05 Chicago, on a 60 cent average for factory lots. Jobbers are selling small lots from stock at $1.15 to $1.20.

Barb Wire.—The recent advance in the price of Barb Wire has had the effect of checking for the time being the demand, but a good many orders representing in the aggregate a considerable quantity of Wire have been placed at the new prices. The manufacturers are evidently working together in harmony and their agreement tends to give the market a steady, if not a strong tone. Quotations for carload lots of Four-Point Galvanized are as follows: Pittsburgh, $2.15; Cleveland, $2.20; Cincinnati or Allentown, $2.25; Chicago or New York, $2.35. An advance of 5 cents per 100 pounds is made on less than carload lots.

Advices from Chicago.—The influences prevailing in the Wire Nail trade are operating in precisely the same way in Barb Wire. Manufacturers are well supplied with orders, and business is coming in quite freely, so that the outlook is good for a large spring trade Stocks have been even lighter in manufacturers' and merchants' hands than those of Wire Nails, and there seems to be no reason why there should not at an early date be a heavier movement in Barb Wire than was seen last month in Wire Nails. If this is the case, prices will very probably advance materially. Manufacturers' quotations on Galvanized Barb Wire are now $2 35, Chicago, while small lots from stock are selling at $2.35 to $2.40.

Lape's Scissors Sharpener.—The Sharpener which is put on the market by W. E. Lape, Syracuse, N. Y., is sold to the trade at $1.50 per dozen net.

Ball Bearing Well Wheel.—This Wheel is put on the market by the T. F. Cheriton Hardware Company, 62 Reade street, New York. The Wheel is sold to the trade from the following list, which is subject to a discount of 35 per cent.:

	Per dozen
No. 01, Japanned Well Wheel Pulleys 10 inch	$8.00
No. 02, Japanned Well Wheel Pulleys, 12 inch	12.00

Glass.—The situation in the Glass market remains practically the same as last week, as far as demand and quotations are concerned. There is a desire on the part of manufacturers whose factories are in operation to secure orders even at a concession from regular quotations. It is reported that factories having a capacity equal to 262 pots have closed down within the past ten days, and that the number of pots, or their equivalent, now making Glass is 878 out of the 1800 pots in the country. During the month of March large orders for Glass are generally placed with manufacturers and jobbers, so that developments in this direction for the next 30 days will be watched with much interest. Pittsburgh quotations are reported as 85 and 10 and 5 per cent. discount for single strength, and 85 and 20 and 5 per cent. discount for double strength Glass. It is understood that more favorable prices are obtainable from both Eastern and Western factories.

Trade Notes.

It gives us pleasure to announce to the many friends of Wallace & Sons, the proprietors of the Brass and Copper Rolling Mills at Ansonia, Conn., with warehouses at 29 Chambers and 5 Reade streets, New York, who last summer, owing to the stringency of the money market, were obliged to go into the hands of receivers, have made a settlement of their affairs with their creditors and the receivership has been vacated. The business of Wallace & Sons has never been discontinued, the receivers having run all the mills during the time they were in charge.

A. Dardell, 292 George street, New Haven, Conn., is putting on the market The Best Ventilator for facilitating the draft of chimneys.

The Columbia Corrugating Mfg. Company, Niles, Ohio, have just completed the erection of a factory measuring 60 x 200 feet, and which has been fitted up with improved machinery. This addition to the plant will considerably increase the capacity of the above concern.

Miner & Peck Mfg. Company of New Haven, Conn., in addition to their regular line of Peck Drop Presses, are about to place on the market a line of Friction Drop Hammers, which are said to possess new and valuable features, the result of long experience and study of the subject.

A large sale of Granite Iron Ware is announced among our Special Notices by E. Bissell, Son & Co., 12 Murray street and 15 Park place, New York. The sale is by order of the St. Louis Stamping Company, and will take place on Wednesday and Thursday, March 7 and 8.

Merry & Clark, 535 West Fifteenth street, New York, issue a notice to the trade informing their patrons that they have secured the agency for the corrugated conductors, eave trough, gutters, elbows, &c., made by Clark, Quien & Morse, Peoria, Ill., and that after March 1 they will carry a stock of from 50,000 to 100,000 feet of assorted sizes of galvanized iron corrugated round and square conductor pipe. They call attention to the fact that this corrugated pipe is made from but one piece of metal, lock seamed and in 8-foot lengths.

The *Silk Herald* of Paterson, N. J., says that among the thousands of people engaged in the silk industry, scattered through the United States, four-fifths are out of employment at the present time.

It is but a short time since New York builders were bewailing the utter absence of life in their line of business. A New York City journal reports, however, that cheap building materials are now causing "an epidemic of office buildings and apartment houses."

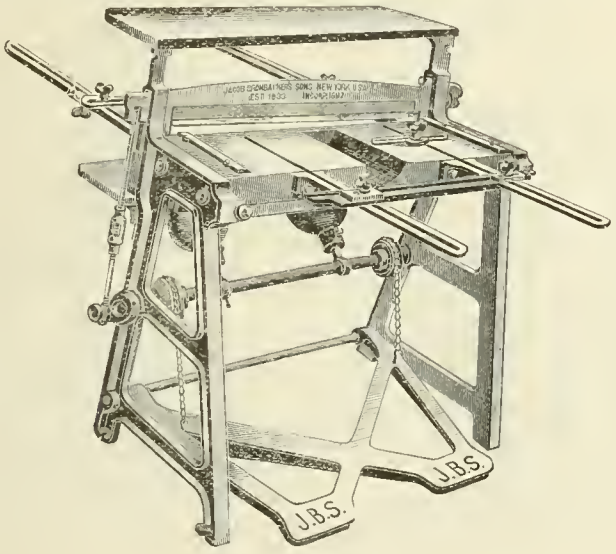
French economists are concerned at the discovery that savings banks deposits in that country have shrunk more than 16 per cent. in the past two years.

New Square Shears.

We show in the accompanying illustration a new square shears that is being put on the market by Jacob Brombacher's Sons, 30 Cliff street, New York. The special feature of these shears is that they cut twice with every operation of the treadle, and that in the machine springs are deue away with entirely. The shear is particularly adapted to factories, and it is pointed out that as every operation of the treadle cuts twice it saves 50 per cent. of the time as compared with single cutting shears.

SCRAP.

In a review of the British tin plate trade of last year the London *Ironmongers' Chronicle* sums up the situation as follows: "The year 1893 has heen a phenomenal one as far as tin plates are concerned. During the whole year the market has witnessed a steady decline, without a single fluctuation of any moment in the contrary direction, the closing price being the lowest ever recorded in the history of the trade.



New Square Shears.

Even this does not seem to be the bottom, for in the current month prices have been reported slightly lower, though this reduction is not general. No doubt the declining prices of tin and steel have helped tin plate makers to face the market, but they are all professing inability to sell at current rates without a loss. At present about 35 per cent. of the mills are shut down, and no rise in values seems probable until the American tariff is definitely settled one way or another."

Gummey, Spering & Co., Philadelphia, Pa., issue circulars directing attention to Gummey's anti-pin hole bright tin plate, which they describe as the only absolutely anti pin hole plate ever made. The trade are well aware how much trouble was experienced in securing plates that would be proof against this inexplicable difficulty of pin holing. We learn from Messrs. Gummey, Spering & Co. that, after an actual test of two years, they are satisfied that they have entirely overcome this defect, which has baffled the efforts of the most expert makers of bright tin plate.

The Continental Tin Plate Works, Twenty-sixth street and Washington avenue, Philadelphia, Pa., of Gummey, Spering & Co., have been running continually since they started, June, 1892, except for a few days in November and about a week later for repairs. They are turning out an extensive assortment of tin and terne plates, including some 18 different brands. In point of popularity the manufacturers especially allude to the Climax, Phenix and Pennsyl Old Method. The latter brand is now being placed on the roof of the Harrison Estate Building, Tenth and Market streets, Philadelphia, the roof requiring 250 boxes of 20 x 28. The Alderly brand they refer to as having been importing and selling for many years, but they are now making it at their own works. These plates are described as all pure American, being made from American black sheets by American labor.

N. & G. Taylor Company, Philadelphia, are sending out to the trade a circular directing attention to the merits of the Taylor Old Style brand of roofing plates. In their letter they refer to the injurious effect of acid flux in the manfacture of tin plate, and also make some observations on the use of palm oil. With thia circular is a *fac-simile* reproduction of a letter from M. Samson, Independence, Mo., in which the writer refers to a lot of Taylor Old Style tin shipped by Taylor & Co. which had been on the roof of his store building for 30 years and never had any paint on it. Samples of this old roof are sent around with the circular letters and bear striking witness to the excellence of the material, the plate showing the marks of time, but not revealing any corrosion through the iron. In other words, it is as water tight as the day it was put on, which is an excellent record for 30 years' exposure.

The Cornish tin mining industry, according to the reports of English journals, is just now at an exceedingly low ebb, Prices have receded to the lowest level and there is no assurance that they will advance for some time to come.

A company has been organized and incorporated in Wisconsin for the purpose of building a canal from Lake St. Clair to Lake Erie, thus avoiding the dangerous places in the present route and shortening the route from West Superior to Buffalo by 100 miles.

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Metal and Miscellaneous Prices.

CHICAGO, MARCH 1, 1894

Tin—
Straits pigs.....21½¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

Steel Coke—IC, 10x14.14x20.$5.65 @$5.75
IC, 14x20.90 ℔ ..... @ 5.25
IC, 14x20, 100 ℔ ..5.50 @ 5.65
10 x 20 ..... @ 8.50
20 x 28...11.30 @11.50
IX, 10x14, 14 x 20 ..... @ 7.25
B.V. Grade. IC,10x14, 14x20.5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—
IC. 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—
IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20.....$7.00
" " IX, 14 x 20..... 9.00
" " IXX, 14 x 20.....11.00
" " IC, 20 x 28.....14.00
" " IX, 20 x 28.....18.00
" " IXX, 20 x 28.....22 00

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00
Each extra cross $2.00 and 20 x 28 double these prices.
Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal, extra, IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00

Almond, IC, 14 x 20..... 6.50
Flint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch, IC, 20 x 28.....@$11.50
Crescent, IC, 20 x 28.....@ 12.25
Crescent, IX, 20 x 28.....@ 15.25
Empire, IC, 20 x 28.....@12.50
Empire, IX, 20 x 28.....@15.50
Hickory, IC, 20 x 28.....@ 12.75
" IX, 20 x 28.....@ 15.75
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 15.00
" IX, 20 x 28.....@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28.....@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28.....@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28.....@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28.....$23.60
Irondale A:
IC, 14 x 20..... $6.25
IX, 14 x 20..... 7.75
IC, 20 x 28..... 12.50
IX, 20 x 28..... 15.50
Westmoreland:
IC, 14 x 20..... $6.25
IC, 20 x 28..... 12.50
Elwood:
IC, 20 x 28 ..... $12.00
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50
Illinois, Old Method:
IC, 20 x 28.....$17.00
E. L.:
IC, 20 x 28.....$12.50
Jessie:
IC, 20 x 28.....$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20 .....$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 .....11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28 .....19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28.....22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28 .....12.50
" " IX, 20 x 28.....15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared).....$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared).....19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)..... 6.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared).....16.50
Columbia, IC, 14 x 20 (Stamped).... 7.25
" IC, 20 x 28 (Stamped)....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28.....13.00
Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28.....12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28.....12.00
Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
" (Redipped), IC, 20 x 28.....17.00

Old Process:
IC, 14 x 20..... 9.25
IX, 14 x 20.....11.25
IC, 20 x 28.....18.50
IX, 20 x 28.....22.50
H. B. L., Old Style:
IC, 14 x 20..... 7
IX, 14 x 20..... 9 25
IC, 20 x 28.....15.50
IX, 20 x 28.....18.50

Sheet Iron—
Black.

	Common American	Refined. American.
Nos. 10 to 16	₩ ℔ 2 6-10¢	3 2-10¢
17 to 20	₩ ℔ 2 7-10¢	3 3-10¢
21 to 24	₩ ℔ 2 8-10¢	3 4-10¢
25 and 26	₩ ℔ 2 9-10¢	3 5-10¢
27	₩ ℔ 2 9-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ ℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.. dis.70&10@75%

Copper—
Ingot.

Lake.....11¢ @ 11½¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount, 30%.

Copper Bottoms.

Discount, 30%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.
Copper, Bronze and Gilding Tube, 3¢ ₩ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ₩ 100 ℔.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl.	43¢ ℔
Bronze Tubing, 3¢ ₩ ℔ more than Brass.	

40 @ 45 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 ℔ casks.....4¾¢
300 ℔ casks.....5 ¢
Loose sheets.....5¼¢

Lead—
Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5¼¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&½.....12¾¢@13¼¢
Extra Wiping.....11¾¢

The prices of the many other qualities of Solder in the market indicated by private branda vary according to composition.

Antimony—
Cookson.....12¢ @12½¢
Hallett's.....11¾¢@11¾¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain	60%
1¼ and under, Galv	52½%
1½ and over, Plain	70%
1½ and over, Galv	60%
Boiler Tubes, list Oct. 24, 1892	70%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—
Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$35.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*
Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ ℔, 2 ¢
" " Brown	₩ ℔, 1¾¢
" " Purple	₩ ℔, 2¾¢
" Ground in oil, B. Red	₩ ℔, 6¼¢
" Ground in oil, Red	₩ ℔, 6¼¢
" Ground in oil, Brown	₩ ℔, 5¼¢
" Ground in oil, Purple	₩ ℔, 6 ¢
Linseed Oil, Boiled, in onls	53¢
Linseed Oil, Raw, in bbls	51¢
Mineral Paints	2@4¢
Orange Mineral	9¼¢
Pure White Lead in Oil	6@6¼¢
Dry White Lead in bbls	5¼@5¾¢
Red Lead, American	6@6¼¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7¾¢
Sipe's Japan Oil, in bbls, ₩ gal	84¢
Spirits Turpentine, in bbls., ₩ gal	35½¢
Asphaltum, Trinidad Refined, ₩ ton	$45
Tarred Felt, 1 Ply, ₩ 100 ℔	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, MARCH 2, 1894.

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal (guaranteed over 94% pure Aluminum), in ton lots..... ₩ ℔, $0.60
No 1 (guaranteed to be 08 % pure and over), in ton lots .....₩ ℔ .65
Lots less than 1 ton, 10¢ @ 12½¢ ₩ ℔ additional.

Antimony—
Cookson.....₩ ℔, 10¾¢
Hallett's.....₩ ℔, 10¼¢

Brass—
Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

25@30%

Copper and Bronze Tubing—
3¢ ₩ ℔ more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c
Over ¼ to 3½ inches inclusive....17¢ ₩ ℔
Over 3½ to 5 inches inclusive.....18¢ ₩ ℔
Piston Rods, Finished True, Smooth and Straight.
Over ¼ to 3½ inches inclusive....18¢ ₩ ℔
Over 3½ to 5 inches inclusive.....19¢ ₩ ℔

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%
Ingot.
Lake.....11¢
Ansonia Grade Arizona.....10¼¢
Ansonia Grade Casting.....9¾¢
Planished.....net
Sheet and Bolt.....25&25&5%

Tubes — See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—
Buffalo Four-Piece.

4¼	5	5¼	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—
Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.
Galvanized.....60%

Round or Square.
Tin.....60%
Galvanized.....60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ ℔, 2.70	3 ¢
Nos. 17 to 20	₩ ℔, 2.80	3.10¢
Nos. 21 to 24	₩ ℔, 2.90	3.20¢
Nos. 25 and 26	₩ ℔, 3	3.30¢
No. 27	₩ ℔, 3.10	3.40¢
No. 28	₩ ℔, 3.15	3.50¢
American B. B.	₩ ℔,	4¢@4½¢

Russia, Planished, &c.
Genuine Russia, according to assortment.....₩ ℔, 11¾@12½¢
Patent Planished....₩ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....₩ ℔, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70&5%@ 2&10%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—
Lee's.....33⅓%

Lead—

American Pig	3⅞@4¢
Bar	4¼¢
Pipe	5¾¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	6¾¢, 20%

Old Lead in exchange, 2¾¢ ₩ ℔.

Metal Expanded—
Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ochar, American	1 @ 1¾
Red, Venetian, American	1¾ @ 2¾

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 10, 1894.

DAVID WILLIAMS, - PUBLISHER

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ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Plumbers' Apprentices.

The apprentice question is attracting much attention among the plumbers. The master plumbers' associations in numerons localities are endeavoring to come to some positive understanding in taking apprentices, so as to put the matter on a more satisfactory basis than has hitherto been the practice. It is very difficult, however, to establish regulations which will be thoroughly satisfactory to everybody. A very carefully prepared plan was not long since rejected by the Chicago association, notwithstanding the efforts of a very able committee to formulate a system of apprenticeship that would be just and equitable to all concerned. At a large meeting of the Minneapolis plumbers a most animated discussion occupied the entire evening and yet was wholly without result. It would seem not a very difficult matter to adopt a few simple regulations which would cover the whole case and stop all trouble. When the attempt is made to cover by positive rules every possible contingency that may arise, more or less difficnlty is always encountered. Few rules and a little chance for modification in special instances would answer the purpose far better and stand a better chance for adoption. The question should be settled before spring work begins.

Waste and Repairs.

It has been pretty thoroughly demonstrated by this time that waste and repairs are very uncertain elements on which to depend for any considerable volume of business. Even a population of 70,000,000 of the most enterprising and usually the most extravagant people on the face of the earth can, when they are forced to economize, cut down consumption in a most disheartening way for those engaged in the business of manufacturing or distributing supplies. The philosophical view of the situation is that in a reasonable time everything in use must wear out or become unfit for further service. Replacements will then be made, causing a fair degree of activity in business circles. But when people are economizing nothing seems to wear out as rapidly as when they have the means to buy freely, and replacements are only made at very long intervals. The United States when prosperous is the best market in the world, and the purchasing power of its people *per capita* is far beyond that of any other country, but the United States when in adversity is perhaps no better than the average European country. Expenses must be contracted within incomes, and if the incomes are light the expenses will be light perforce.

Future Consumption.

If the business of the United States should for any reason from this time forth be strictly limited to the actual necessities of its people there would be no future for the manufacturing establishments now standing idle. Those in operation could easily supply all wants, and perhaps not strain their facilities to meet the requirements of some substantial growth in the population. This is almost an assertion that a large part of the manufacturing and commercial facilities of the country is superfluous, and has been built up far beyond our needs. It would be true if our present condition were normal. But this stringent economy, this greatly restricted consumption, is not the natural condition of Americans. They may be depended upon to work out of it, slowly, perhaps, but surely; and the time will come when enterprise will displace timidity, frugality will give way to liberality and consumption will increase in every channel of trade. The masses will then be again well employed, and their earnings will again sustain the fair commercial fabric whose glory is now so sadly clouded.

Ex-Mayor Abram S. Hewitt proposes that, as private capital cannot be induced to provide rapid transit for New York City, the city should advance the capital for and own the new road, leaving its construction and operation in the hands of a corporation. Mr. Hewitt's plan has been approved by the New York Chamber of Commerce.

For some hours of one day, recently, the city of Buffalo was absolutely without water owing to the failure of the natural gas supply, which is used to run the engines at the pumping station. As a similar mishap occurred a month or so ago, the city government has decided to begin the entire substitution of coal for gas, the supply of the latter being deemed too uncertain to risk its continuance as fuel.

Cleaning Castings With the Sand Blast.

The principle of using sand as an abrasive by propelling it through a blast at high speed, which was invented by J. C. Tilghman of Philadelphia, has been used for some years in England by the Tilghman's Patent Sand Blast Company, Limited, at Sheffield, for the removal of molding sand, scale, &c., from steel, iron and brass castings, forgings, plates, and also for cleaning the atone work of public buildings. For propelling the sand compressed air at from 8 to 10 pounds pressure per square inch is employed. Chilled iron globulea instead of quartz or flint sand are used with good results, both as to speed of working and cost of material, when the operation can be carried on under proper conditions. With the expenditure of 2 horse-power in compressing air 2 square feet of ordinary scale on the surface of the steel and iron plates can be removed per minute. The surface thus prepared is ready for tinning, galvanizing, plating, bronzing, painting, &c. The innumerable little indentations form an excellent anchorage for the protecting materials, causing them to adhere with much greater force than to an acid or otherwise cleaned surface. The advantage of this method of cleaning castings is that it acts with equal rapidity and thoroughness upon flat, curved, angular and indented surfaces. By continuing the operation the hard skin on the surface of castings, which is so destructive to the cutting edges of milling and other tools, can be removed. Small castings are placed in a sort of slowly rotating barrel open at one or both ends, through which the blast is directed downward against them as they tumble over and over. No portion of the surface escapes the action of the sand. Plain cored work such as valve bodies can be cleaned perfectly both inside and out. One hundredweight of castings can be cleaned in from 10 to 15 minutes with a blast created by 2 horse-power. The same weight of small forgings and stampings can be scaled in from 20 to 30 minutes. We understand that those who have developed the Tilghman process in England contemplate starting a similar business at an early date in Philadelphia, J. S. Mathewson, managing director of the company, having been in the employ of Mr. Tilghman since 1870. We understand that Mr. Mathewson, Mr. Tilgman and his brother, who reside in Philadelphia, are the sole proprietors of the business, which, therefore, seems destined to return to this country after years of development in Great Britain.

Southern journals agree in discerning a solid and genuine revival of business prosperity in the South; the result, largely, of organized effort to attract investment to the centers of population and to advertise the towns. The revival does not partake of the nature of a "boom," but is an honest advance in growth and values, which bids fair to be permanently progressive.

The Cleveland, Ohio, Chamber of Commerce is arranging for the celebration in 1896 of the city's centennial.

THE LETTER BOX.

A Stove Repair Suggestion.

From F., *Virginia.*—I notice in *The Metal Worker* something about marking stove repairs. I think that stove makers ought to furnish dealers with a list of all their stoves which have interchangeable parts, as it is frequently found that parts of one stove will fit a stove of a different name. If the dealer knew all such interchanges he might prepare to supply repairs for the various named stoves without having to order specially for each stove.

When a stove is brought to the shop for repairs there is a chance to try such parts as are on hand. But when a customer wants a grate, fire brick or cross piece he does not want to haul his stove to the shop, but comes or sends for the pieces wanted, and hardly ever can give the right directions for ordering, which makes delay, and the freight on small parcels eats up the profit, to say nothing of packages lost in transit and never found. If each stove maker would furnish a list of all his stoves, with description of parts fitting the different named and numbered stoves, a stock of repairs could be carried to suit the stoves in use in each section, which would be the means of saving a great deal of writing, booking, collecting small bills, postage and freight on those troublesome little orders.

This is submitted for the consideration of the stove trade generally, and comment solicited.

No Regulation.

From J. D, *Brooklyn, N. Y.*—Will you kindly publish the plumbing regulations of Plainfield, N. J., in relation to new work? Can a New York plumber do the plumbing work in a new house, and what are the cost of sewer and water connections to plumbers?

Answer.—We learn from a Plainfield plumber that there is no ordinance in that city governing plumbers and plumbing work. A fee of $10 is charged by the water company for tapping the main. There is no system of sewers.

Objects to Exposed Piping.

From L. W. F., *Earlville, N. Y.*—Will *The Metal Worker* inform me in an early issue the proper way to pipe a range boiler? My customer does not want the pipes to appear around the side of the room, which is nicely finished, yet wants hot water at the sink, across the room from the boiler. Can the piping be taken off the top of the boiler in the usual way and then run down and under the floor, across to the sink, and then rise to the faucets? If piped as suggested, will the job give satisfaction?

Answer.—Many boilers are in use piped as described, giving satisfaction, though some annoyance has in some cases been experienced from an accumulation of air in the bend where the pipe turns down at the top of the boiler, if no pipe is run direct to an upper floor. The annoyance, however, has never been sufficient to condemn such a method of piping.

Better Marked Stove Repairs.

From W. H. Drummond & Sons, *Newark, N. J.*—In answer to "J. F. T.," Meadville, Pa, in *The Metal Worker*, February 10, we send a tag that we use which has been found very satisfactory. As soon as the repairs arrive the tag is attached to them and a postal card sent to notify the customer.

MEMORANDUM OF ORDER.

Ordered for *James Smith.*
Address, *74 Summit street.*
Name and No., *8-20 Domestic.*
Date, *1881.*
Maker, *Mt. Penn Stove Works.*
Repairs Ordered,
1 set of brick,
1 grate,
1 guard plate.

Price, *$2.50* 189
Deposit, *1.00* Order Forwarded,
Due, *$1.50* *February 24*, 1894.

STOVE REPAIR DEPARTMENT OF
W. H. DRUMMOND & SONS,
85-87 MARKET STREET, NEWARK, N. J.

Choked Flues.

From V. T., *La Crosse, Wis.*—Please state in *The Metal Worker* which would be the most desirable chimney on a permanent building, a square brick chimney or a round iron smoke stack, giving hight and area, to serve a horizontal tubular return flue boiler 2 feet in diameter and 8 feet long, having 25 2-inch flues. This boiler is now placed in the ordinary brick setting, having 2 foot grate bars and a patent water back and connected with a 12-inch smoke pipe about 6 feet long having a rise of 20 inches and two easy curve elbows, terminating in a brick chimney 14 x 14 inches about 13 feet high. This chimney is capped out with a 15-inch round sheet iron smoke stack about 20 feet high, making a total hight of 33 feet. The boiler, which is on a farm, has been in use a number of years, and is still being used for cooking feed and furnishing steam for a small engine located in a one-story building, far enough from the other buildings so that the wind seems to have no influence on the draft. The draft, however, seems at all times to be very poor. The fuel used is principally dry hardwood, though some pine edging and possibly some corncobs may have been used. Is the flue too large and would you recommend a smaller flue instead of the present one? It is presumed that all the openings in the chimney are closed.

Note.—Our readers are invited to give their views on this subject. In the meantime we would suggest that the brick chimney has always been regarded as more permanent than an iron smoke stack. However, the use of wrought iron chimneys is growing, owing to the satisfaction they give on all points. The chimney reported here seems to have ample capacity for the boiler with which it is connected, and is sufficiently high to do good service. From the character of the fuel used, we are disposed to think that the trouble arises from the flues being choked with soot and fine ashes, and that if the tubes and main flue of the boiler are thoroughly overhauled and cleaned better service will be rendered by the chimney. The chimney has capacity for a larger smoke pipe from the boiler than is now used in connecting it, and an increase in the size of this pipe may improve the conditions. From the use that is made of the boiler at present it is possible that a smaller chimney would be more satisfactory.

Size of Pipe.

From J. J., *Wilmington, Del.*—In reading some of my old *Metal Workers* I find the trouble of "R. J. M." in *The Metal Worker* of December 9, in which he is unsuccessful in heating his radiator from range boiler. I think his trouble is from using too small pipe. In hot water fitting the supply pipe to one or more branches generally has an area equal to the combined size of the other pipes, and if he will enlarge his hot water supply pipe I think that some of his trouble will be remedied. He will need an increased water back capacity, as I understand his case.

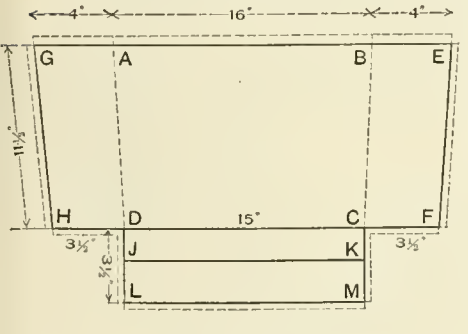
What Caused the Collapse?

From R. D., *New York.*—In reply to "H. D.," whose letter appeared in *The Metal Worker* of February 10, I attribute the collapse of the boiler to the following causes: First we have a column of water 6 feet high, which will exert a pressure of $2\frac{5}{10}$ pounds without allowing for friction, but owing to the long run of piping, the sharp bends, and the lowering of the water in the supply tank, I doubt if there would be $\frac{1}{2}$ pound pressure in the boiler. Therefore, a slight pressure formed in the boiler would stop the supply entirely. While under such conditions, suppose that a cold water faucet is opened. The water will start from the point of the greatest pressure, and that is from the boiler, and it will be seen that all of the water will be syphoned out of the boiler. When the faucet is closed the supply starts again, and the cold water coming in contact with the hot water and steam causes the noise heard. There is a vacuum formed by the condensation of

the steam in contact with cold water, and before the boiler can fill the collapse takes place. A horizontal check valve on top of the boiler would stop the syphoning. The expansion pipe should be taken to the furthest end of the system shown, and connected at the sink. This would keep that line circulating, and afford some relief through the water being cooled.

Construction of Range Reservoir.

From C. M. W., *Spencerport, N. Y.*—I send a method for constructing a range reservoir, with little waste of material. Suppose the required article to measure 8 x 16 inches at top, 7 x 15 inches at bottom, and to be 11½ inches high. First lay out the side, as shown by A B C D, and then add the half ends, as B E F C, A D H G. If the material is of sufficient width on D C draw the half of bottom, as indicated by D C M L. If the material is not of sufficient width a piece may be required, as indicated by J K M L. Two pieces



Construction of Range Reservoir.—Pattern for Half of Reservoir.

similar to that shown in the engraving are required for the article, and the forming is to be done on lines B C, C D and D A. The usual allowances for edges are to be made, as indicated by the dotted lines.

Difficulty with Drive Well.

From H B., *Woodhaven, L. I.*—If "M. W." of Little Falls, N. Y., who made inquiry in *The Metal Worker* of February 10, will examine his driven pipe and finds it all right—that is, straight down and the point not more than 26 or 28 feet below the valve in the pump—then his pump should work. Two or three feet of water in a driven pipe is never sufficient to supply the wants of a pump cylinder of ordinary size, therefore let him drive 5 feet deeper and get a good supply of water, provided he will reach sand or gravel. We have here 5 to 8 feet of water and then 2 to 4 feet of clay. Water will never enter the point in the clay, consequently the handle flies up from a vacuum being formed in the pipe. He may find the pipe is old and rusted out, and in that case he would have to drive a new well.

From I. K., *Shelbyville, Ind.*—Not having seen anything in the Letter Box from Indiana for some time, we "Hoosiers" thought we might help "M. W." in getting his driven well to work. He should pull up and clean his point, then rub it thoroughly with bar soap until the meshes of the strainer are all full, then put his point down to where it reaches gravel and water. Take his sand pump on ⅝-inch pipe and put it in the point and agitate the water and soap and it will wash the screen clean. Then if he has plenty of water his pump will work easily. After he has tried this let me hear from him. I have been in the business for years and know this method works when all others fail.

A Pump is Best.

From J. H E., *York, Pa*—Being a constant reader of *The Metal Worker*, I desire to ascertain through its columns if there is any kind of an appliance made to lift water from the level of reservoir pressure to a higher point? To explain more fully, I have a ⅝ lead pipe running from street main through cellar up to kitchen sink, but the water will only flow 2 feet above the floor. Now, is there anything to force the water up to the attic tank 15 feet from the water level? If there is, I would like to know of it and where it can be bought.

Note.—Some of our readers may have discovered a method of raising water different from the old and generally used plan. We would suggest the use of an ordinary pump as being the least troublesome and probably the most satisfactory. Of course, rams or water motors could be used, but it is hardly likely that they would be practicable.

Seamless Zinc Tubing.

From A. R. B., *Minneapolis, Minn.*—Can you inform me who manufactures seamless zinc tubing?

Note.—So far as we can discover seamless zinc tubing is not made, but if we are mistaken in this we shall be glad to be informed of the name of the manufacturer.

Left Handed Tinners.

From E. L. H., *New York.*—In answer to "Right Hand," Pennsylvania, whose letter appeared in *The Metal Worker* of February 24, would say that I have a man who has worked with and for me all of 15 years. He is a first-class workman in every respect, either on the roof, on a ladder or in the shop at the bench, and is as good an all around man as I ever saw. He solders left handed, handles the snips and bench shears left handed, hammers left handed, uses his left hand for cutting and finishing and, in fact, never uses his right hand, except in the same way that a right handed man would use his left. I have seen my left handed man do work on a roof where any right handed man would appear worse than an apprentice alongside of him.

From LEFT HANDED TINNER, *Pennsylvania.*—I notice in *The Metal Worker*, February 24 the letter from "Right Hand." I also am a Pennsylvanian, but I decidedly disagree with my fellow countryman. I am a born left handed man, and when I found that my left hand was not so useful in the tin trade I was going to use the right altogether, but my employer told me to use both, as he said I would find it useful all through the trade. So I took his advice and found that he was right. It is especially convenient when I have to solder all day, for I can change the iron from one hand to the other, and in other work it is similarly useful. I do most of the work with my right hand, and I think a left handed man can become more active with his right hand than a right handed man can with his left. The great advantage of using both hands is that one is able to get to places with either hand where he would find it very awkward if he could only use his right hand.

From E. W., *Pulaski, Va.*—I notice the letter from "Right Hand" in *The Metal Worker* of February 24. His little story of the left handed boy who was just learning his trade was very amusing, but I am impelled to ask him if the reason the boy melted so much solder was that the soldering iron was used so long right handed that it wouldn't work any other way. I am a left handed tinner, and in my 15 years' experience I have worked with many right handed tinners as well as many left handed ones. I have never had a left handed tool made and find no inconvenience in handling any tinner's tools and have often felt sorry for right handed tinners when they have to do something where I had the advantage of them.

Troublesome Terra Cotta Chimney.

From J. S. B., *New Berlin, N. Y.*—I have a warm air furnace in my cellar, and to avoid running pipe through rooms above I built out of doors, back of my dwelling, a chimney of 10-inch vitrified sewer pipe 35 feet high, cementing all the joints tight. I connected the smoke pipe from the furnace to the chimney directly from the cellar. The chimney had a good draft and worked well in every way for about four weeks. Then I found if a check damper in the smoke pipe, which opens and leaves a hole in the same, was left open four or five hours that there was not a particle of draft in the stove pipe. Paper saturated with kerosene when ignited would immediately become extinguished when thrust in the check damper hole in the smoke pipe, and it would take from 15 to 20 minutes for paper saturated with kerosene oil to burn in the fire box of the furnace in order to start the draft again. What is the matter, and what is the remedy?

Note.—The experience of our readers with terra cotta chimneys will be gladly received. In this case the trouble seems to be caused by the air entering through the check draft and thoroughly cooling the chimney, so that there is nothing to create an upward current of air in it. The remedy would be to so arrange the check draft that there will always be some hot air or gases passing from the fire to keep the chimney warm enough to create upward currents. The thickness of the pipe is not sufficient to retain heat for a long time and being entirely exposed to the outside atmosphere it is quickly cooled. The capacity of the chimney is greater than the furnace requires, necessitating that the draft be checked, and it is probable that a 7-inch pipe would have been more satisfactory, as then the fire would need less check and the terra cotta flue would not become so cold as to stop the draft.

STEAM AND HOT WATER.

Radiator Connections and Mains.

BY HELIOS

Fig. 1 shows a two-pipe connection to a radiator. It is not good practice in placing a one-pipe steam apparatus to use a one-pipe connection to a radiator that has 100 feet of heating surface or over, unless the radiator has a base with a large apace in it. With a radiator having the sections connected together with nipples, the opening through the radiator is so small that a perfect circulation cannot take place and the radiator is liable to fill with water. If the radiators have over 100 feet of heating surface and they are connected together with nipples, use the connection shown in Fig. 1 and place in the return pipe a swing check valve. Be sure that the return pipe that has the check valve in it is level, for if it has a drip to the return pipe the valve will not close tight and steam and water will back up into the radiator when the valve on the radiator is closed.

Fig. 2 shows the manner of taking a connection from the main steam main to a riser that is to go up in the corner of a building. The main steam pipe has a drip from the boiler, as shown by the arrows. The branch pipe is taken off after the pipe has passed the corner, the branch being taken from the top of the steam main. This supplies dry steam and allows for the expansion of the main pipe, and also allows for a good drip from the riser back into the main steam pipe.

Fig. 3 shows connections to a heater. The steam main is carried from the boiler as near the ceiling as is possible, with allowance for covering and connections to radiators and risers, and must drip from the heater, as shown by arrows. In all one-pipe work it is best to keep the return pipe above the water line in the heater. The return pipe must have a true grade back to the heater. In the return pipe at the heater place an automatic air valve above the water line, which will relieve the return pipe of air and give a perfect circulation.

Fig. 4 shows steam and return connections at the end of the main pipe; also branch to radiator or riser from the end. This connection can be used on the end of a steam main, as it saves

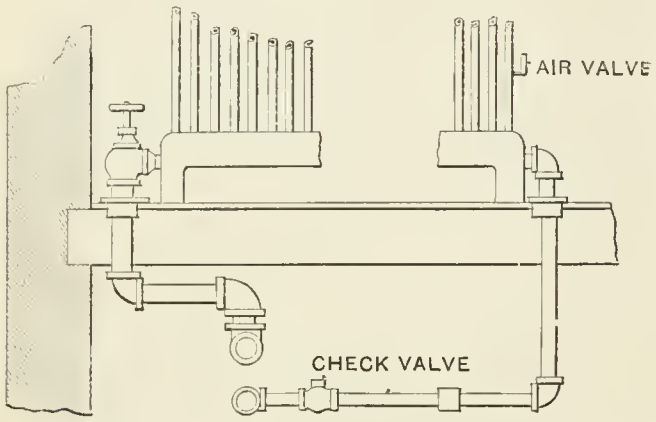


Fig. 1.—Two-Pipe Connection to Radiator.

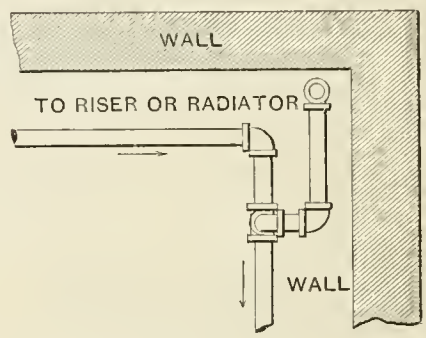


Fig. 2.—Connection to Corner Riser.

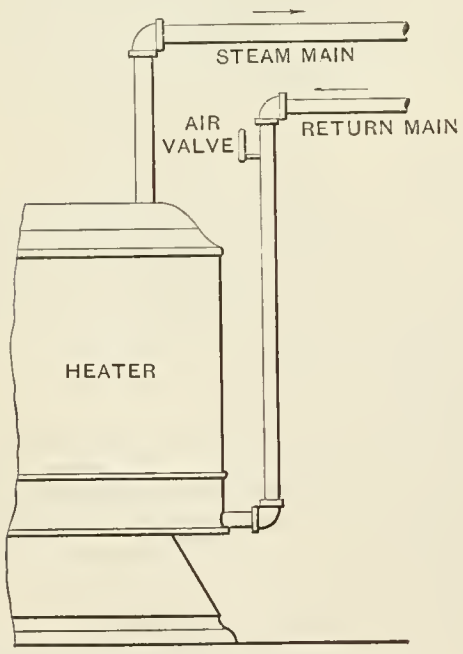


Fig. 3.—Heater Connections.

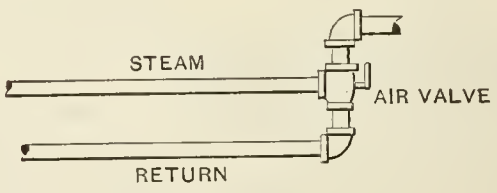


Fig. 4.—End Connections.

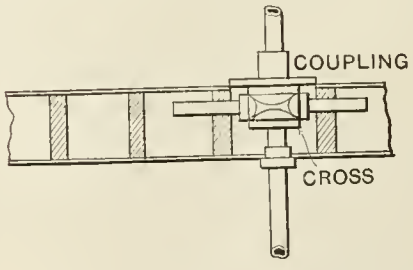


Fig. 5.—Riser Support for High Building.

placing a fitting in the main pipe and allowa a good drip from the branch pipe. Drill a hole in the fitting on the coupling on the riser and then slide over the riser across with side openings to take 1 or 1¼ inch pipe. Screw into

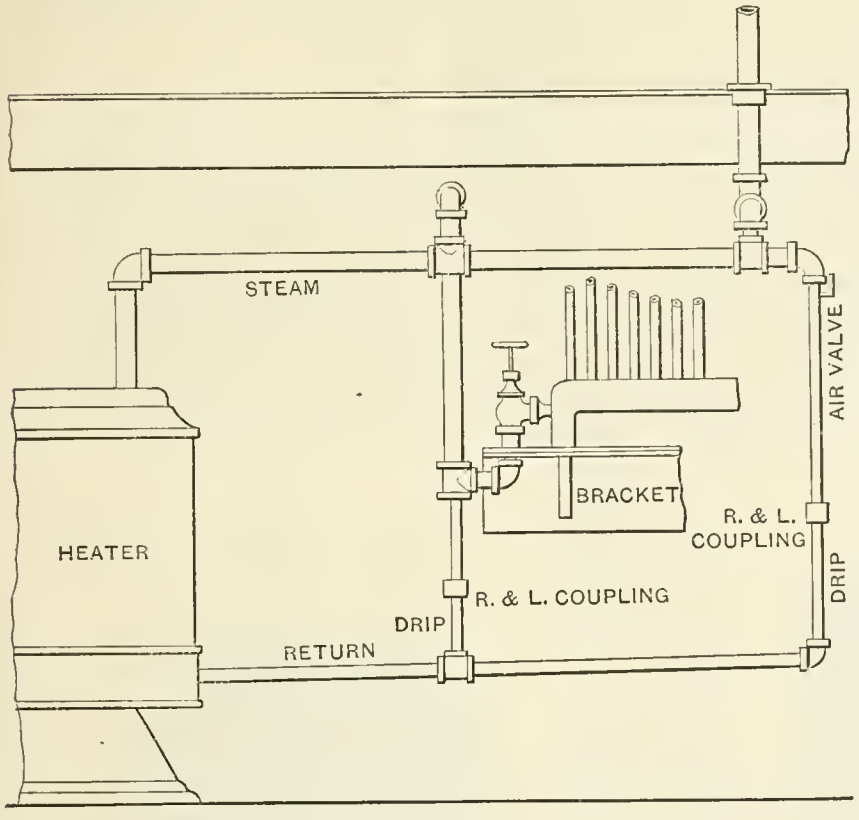


Fig. 6.—Connections for Radiator on Boiler Level.

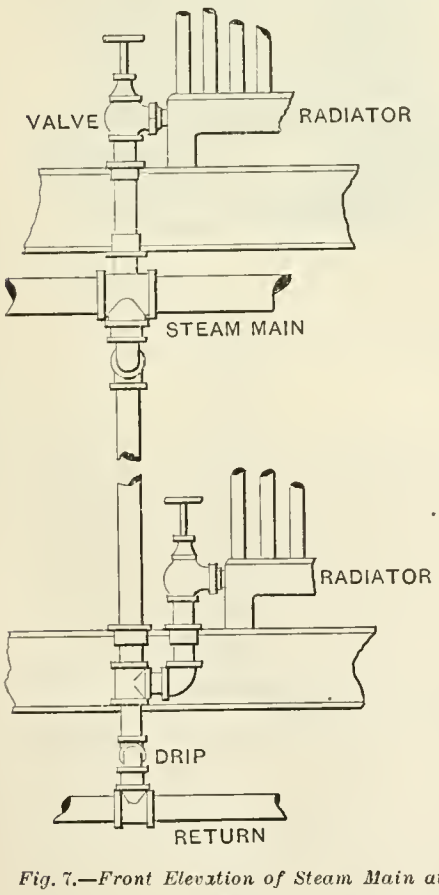


Fig. 7.—Front Elevation of Steam Main at Ceiling.

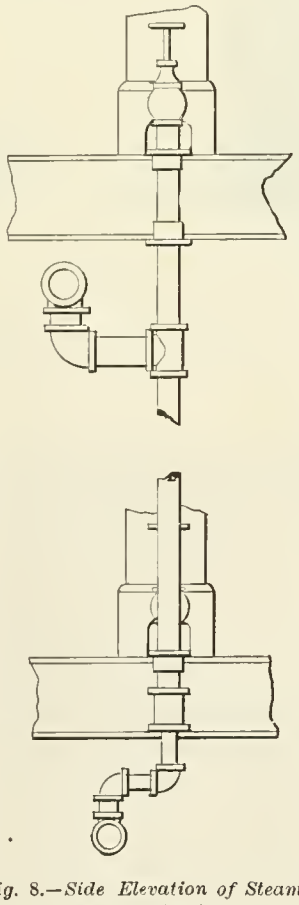


Fig. 8.—Side Elevation of Steam Main at Ceiling.

RADIATOR CONNECTIONS AND MAINS.

end of the main and place an automatic air valve.

Fig. 5 shows the manner of supporting riser in a high building. Place a the cross short pieces of pipe that will carry the weight of the riser, as shown in Fig. 5. This support must be placed in the middle of the riser, or as near as possible, so that it will hold the riser stationary at this point, and the expansion will be up and down from this support.

Fig. 6 shows the manner of connecting up a steam heating apparatus in a building where the boiler and radiation are all on the same floor. Run the main steam pipe close to the ceiling and take the branches from the top and turn down to the radiators, as shown in Fig. 6. This is done to allow for the expansion of the main pipe. The radiation, which is supported by brackets bolted to the walls of the building, is placed in position and connected up, as shown in Fig. 6.

Fig. 7 shows pipe connections to radiators in a building where there is not room under the first floor to run the steam main. The illustration shows the steam main run at the ceiling of the first floor, with branches up and down to the radiation and with the return main under the first floor.

Fig. 8 shows a side elevation of the connections shown in Fig. 7.

Furnace Coil in Conservatory.

From E. & H., *Oshawa, Ontario.*— We are pleased to see the Letter Box so interesting. It encourages all to show their own "hand" of ignorance, so that they may gain information thereby. In connection with a dwelling house in which we have placed a hot air furnace, the owner put up a conservatory, 40 x 12 x 7 feet high, forming a leanto against the east side of the dwelling, which he proposed to heat by hot water by placing a coil of pipe in the furnace. Now, what size coil will be required, or what rule is there for determining the amount of surface to be exposed to the fire to heat a given number of cubic feet of air?

Answer. — The application of the cubic foot rule in apportioning heating surface requires so much personal judgment, even in house heating, that many authorities discard it altogether. In greenhouse heating it is seldom or never used, the heating surface required being computed from the glass surface exposed, 1 square foot of heating surface being used for 2, 3 or 4 square feet of glass surface, according to the temperature of the water in the heating pipes. In the greenhouse mentioned there is, let us assume, an exposure of 760 square feet of glass surface, and in order to make sure of its being heated, with the water at a temperature of 160°, 1 square foot of heating surface will be calculated to heat 2½ square feet of glass surface. Consequently, about 300 square feet of heating surface will be required in the greenhouse. The heating capacity of coils placed in hot air furnaces varies very materially, so that the use of any rule to determine this has proved unsatisfactory, except when used with considerable judgment. An approximate rule, which has given satisfaction, is to allow 1 square foot of coil surface to 30 square feet of heating surface. In this case, a coil containing 10 square feet of surface would be required, and 2-inch pipe is the best size to use to connect with the piping necessary to supply the amount of heating surface required. About 1.6 lineal feet of 2-

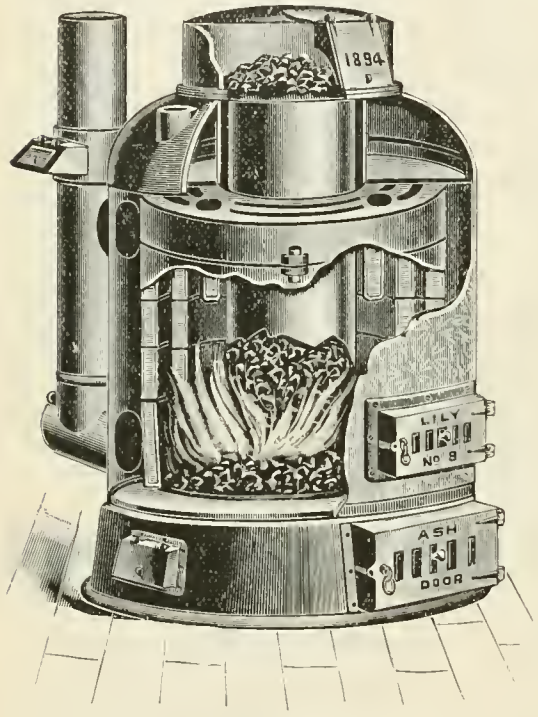
inch pipe are required to give a surface of 1 square foot. In heating greenhouses and conservatories the heating surface is generally placed in coils either along the walls or under the flower benches and less than 2-inch pipe is seldom used, while many advise the use of 4-inch pipe.

The New Lily Steam Heater

Rubel & Co., 114-116 Lake street, Chicago, are introducing the Lily steam heater, which is herewith illustrated in Figs. 1 and 2. It is constructed entirely of cast iron, and consists of from four to six hollow cast iron water sections and dome, circular in form, connected by three waterway openings and three oblong flues. These flues, as shown in Fig. 2, extend in and impinges against the broad surface or bottom of done. The fuel reservoir is unusually large, holding from 15 to 24 hours' fuel, and enabling the heater to carry steam for the same length of time. It is self feeding, and, it is said, does not clog up. In mild winter weather, with proper management, one filling is sufficient to generate steam for 24 hours. A 2-inch pipe containing a damper and leading from top of this fuel chamber to smoke pipe carries off any gas that might accumulate in it from the burning coal. The feeding door to the fuel reservoir is just above the steam dome, within convenient reach, and is of the type known as the side feed. The door is easily thrown back out of the way when supplying fuel. This heater also has a large feed door over fire pot so that it can be used as a surface feed if so desired. The fire is controlled by a check and jacket until they come in contact with the baffle plate, which is on top of the lower section; there they are turned forward then downward, passing around the fire pot to its rear, where they enter the smoke stack.

Wants a Heating System.

From C. F. S., *Trenton, Tenn.*—I have a customer who has a dry goods store, 125 x 22 feet and two stories high, that he wants heated by some other means than the common stove. The house is so located that a basement could be made, but my customer wants to avoid the cost of a basement. We have electric lights but no water works. What system of heating, under the circumstances, would you advise? My customer says he has read about stores being heated like sleeping cars. How are sleeping cars heated?



The New Lily Steam Heater.—Fig. 1.—*Broken View of Heater.*

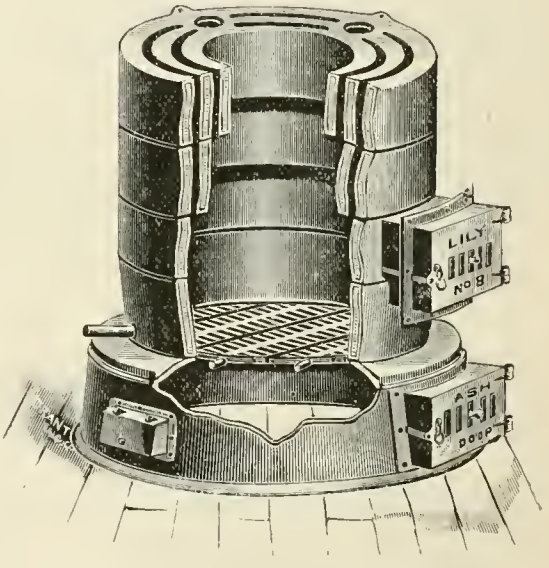


Fig. 2.—*Broken View with Casing Removed.*

length one third around the rings, being also extra large in width, creating a quick and positive draft through the heater, precluding, it is pointed out, any danger of clogging with soot or dust. The waterway openings in the several sections, when in place, directly above one another, constitute the means of communication for the water and steam between the several sections, and are of sufficient size to circulate the water freely through them. The lower section, or fire pot, which rests on the base, is conical in shape, being smallest at the bottom, and connects with the outer rim of the rings, thereby placing the flues of the sections resting on it directly over the fire, circulating the heat upward through the flues and interior of the heater while it is most intense. It is made in circular form, not divided, and is also a water section. Its communication with the other rings is through the three waterway openings described above. The steam dome, or top section surmounting these rings, is exceptionally large, and is used exclusively as a steam dome, no water being carried in it. The heat, as it is generated, passes up through the heater draft door, placed at the back in the smoke pipe, and a draft door on the base, which are attached to and operated by an automatic regulator capable of being adjusted to any desired pressure. A safety valve, guarding against an overpressure of steam, water gauge and steam gauge, registering the amount of pressure, and the necessary piping complete the fittings of the heater. The direct draft to be used in starting the fire is placed at the bottom of the dome connecting the top of the flues directly with the smoke stack and carrying off the accumulation of gas and smoke incident to the starting of fire. The grate is described as simple and easily operated by means of a shaking lever.

The heater is surrounded by three jackets, the inner one of black and the outer one of galvanized iron, the middle one being a heavy lining of asbestos. These three jackets are riveted together and are put on as one piece. The products of combustion pass up through the center of the heater and at the same time through the flues, then turn outward from the lower surface of the steam dome and descend downward through the space between the heater

Note.—Doubtless some of our friends in the trade can give this inquirer some acceptable method of heating a store. The discussion of heating radiators on the same level as the boiler which has been going on in the columns of *The Metal Worker* recently should be interesting to this correspondent, and we think, under the circumstances, that a hot water apparatus located at some convenient place in the store, and the piping run to radiators located advantageously, would make a satisfactory method of heating this building. Possibly an overhead steam system might be preferred. Sleeping cars, as a rule, are heated by steam.

A. G. King, Western manager of the Herendeen Mfg. Company, has removed from the Unity Building, 79 Dearborn street, to a large and more commodious office on the ground floor of 131 Lake street, Chicago. In the salesroom will be carried samples of the Furman boilers, brick set and portable, for steam

and hot water, together with a full line of radiators and steam fittings. The Herendeen Mfg. Company, we understand, have added to their business the manufacture of a line of horizontal tubular boilers for power and heating purposes.

School House Heating and Ventilation.

That a good atmosphere is as essential as a comfortable temperature in schools is a fact that is rapidly being accepted and put in practice, a case in evidence being the two large school houses recently erected at Johnstown, N. Y. The illustrations show the basement and two floors, with the heating and ventilating arrangements as installed by W. Lynes of that city. The hall and the rooms on one side of it only are shown in the illustrations, as the rooms on the other side of it are exactly like those shown. The heating in both school houses is done by steam from two No. 6 Gorton boilers, made by the Gorton & Lidgerwood Company, 96 Liberty street, New York. One of the boilers heats the halls in addition to the rooms above it, as shown in Fig. 1. Fig. 2 shows the arrangement of the first floor, with the location of the coils, radiators, registers and flues, and Fig. 3 shows the second floor. The heating is principally done by direct radiation, a 75-foot radiator being placed on each side of the lower hall, which is 66 feet long and 10 feet wide, and a 62-foot radiator being used at each side of the upper hall, which is of the same dimensions as the lower hall. A 32-foot radiator is used in the coat rooms, which are 38 x 10 feet. The four schoolrooms are each 26 x 34 feet and are warmed by wall coils extending along the exposed wall, each presenting 100 square feet of radiating surface and made of 1-inch pipe. In the basement are four stacks of indirect radiators, each containing 165 square feet, and are inclosed in a box lined with galvanized sheet iron and supplied with air from out of doors through a galvanized sheet iron duct, 12 x 12 inches. These indirect radiators connect with a tin lined flue 8 x 20 inches in size and lead to 16 x 20 inch registers in each room. By this means there is a constant inflow of fresh warm air, supplying a wholesome atmosphere for the pupils. The air in the room is drawn out to make room for the fresh air by means of ventilating flues, 20 x

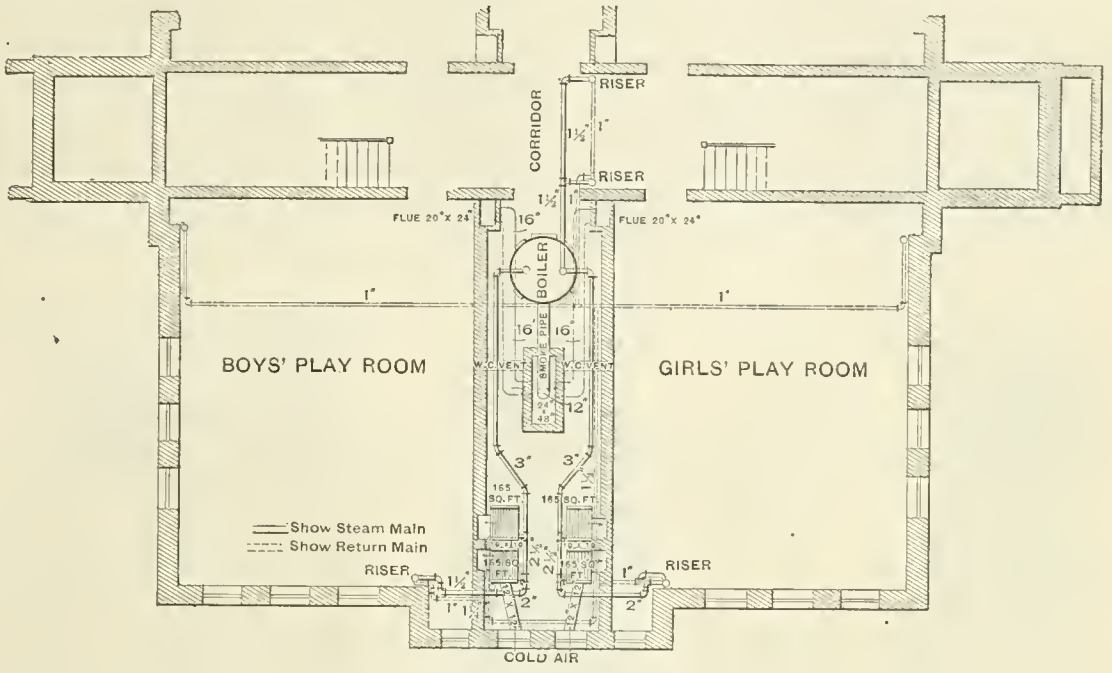


Fig. 1.—Showing Basement and Heating Plant.

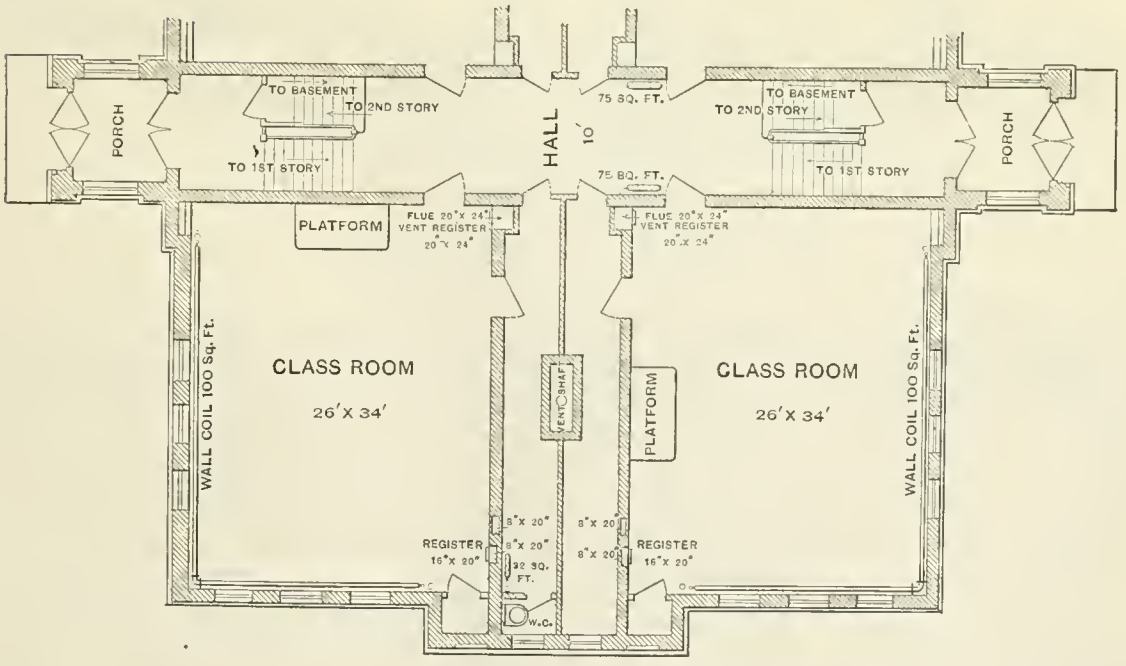


Fig. 2.—Showing First Floor.

24 inches, and having 20 x 24 inch registers in them, at the inner corner of the rooms, and connected by a 16 inch round pipe with the 24 x 48 inch ventilating shaft that runs up through the cost rooms. The ventilating registers in the lower rooms are connected with the ventilating shafts by the round pipes running down into the cellar and along under the floor, while those on the upper floor run up to the attic, and there extend over to the shaft. The ventilating shaft is heated by the smoke from the boiler entering a 12-inch smoke stack made of No. 12 iron that extends to the roof. A constant draft is maintained at each of the ventilating registers, and the air in the schoolrooms is being continually changed and freshened without the temperature being affected or disagreeable air currents being produced. The heating plant is of the gravity return system, the steam mains from the boiler being 3-inch and gradually reduced to 2½, 2, 1½ and 1¼ inches, while the return mains gradually increase from 1 inch to 1¼, 1½ and 2 inches at the boiler and no check valves are used on any part, ample relief being given to the system at various points.

A full open way valve is put on the return at the boiler, so that repairs can be made below the water line without emptying the boiler. The boilers and systems in both school houses have been thoroughly tested and an ample reserve capacity shown for colder weather than has yet come.

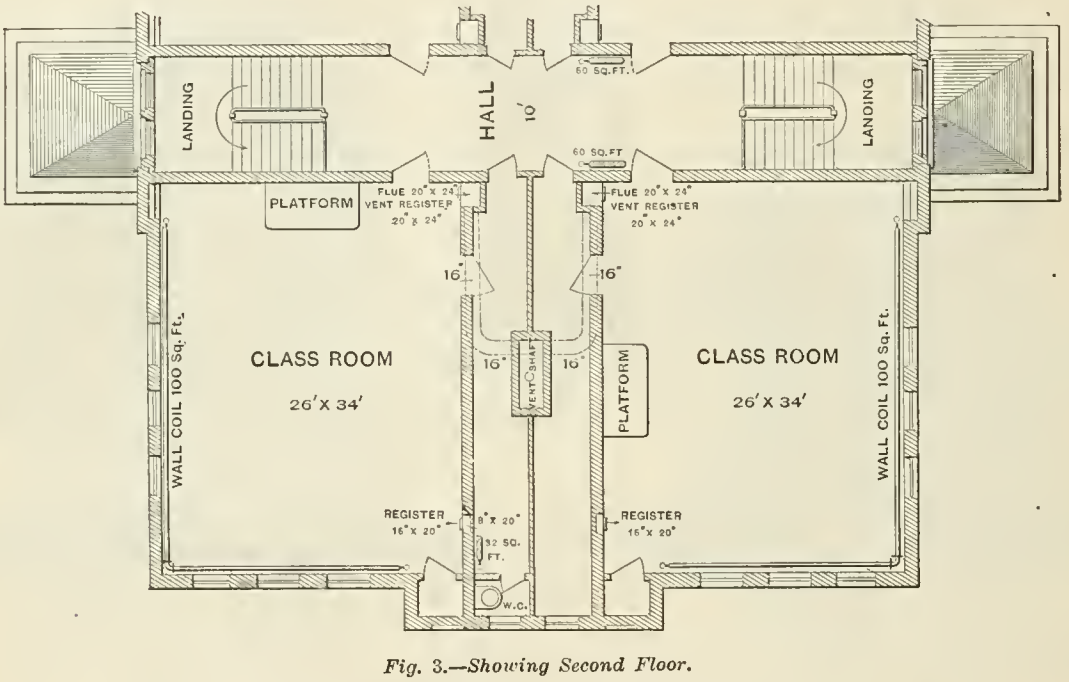


Fig. 3.—Showing Second Floor.

SCHOOL HOUSE HEATING AND VENTILATION.

HEATING NOTES.

TREASURER A. J. HAMMETT of the Richmond Stove Company, Norwich, Conn., was the guest of Higgins & Co., 379 Lexington avenue, New York, on Wednesday.

ANNOUNCEMENT is issued to the trade from St. Louis, Mo., under date of March 1, by John B. Hughes and H. W. Stone, that they have entered into a partnership, at 106 North Tenth street, under the name of Hughes & Stone, for the purpose of conducting a business for the construction of steam and hot water heating apparatus; also steam piping work in all its branches.

HIGGINS & Co., 379 Lexington avenue, New York, are issuing a 12-page catalogue in a yellow cover of the Richmond hot water heaters adapted for small work in stores, offices, conservatories, bathrooms and stables. Full page cuts show the methods of using them for conservatories and for furnishing a domestic hot water supply. This house make a specialty of house heating with hot air, hot water and steam, using the heaters of the Richmond Stove Company of Norwich, Conn., and have their showroom arranged with the Richmond and Victor heaters displayed so that the construction and operation can be readily seen. One of the Victor boilers is shown with parts cut away so that the interior is exposed to view, and a novel feature of a Richmond return flue sectional is that the sides are painted in colors to represent fire, showing exactly the passage of the flame through it. In addition to their New York store, convenient to the Grand Central Station, Higgins & Co. have another store and construction shop at Mount Vernon, N. Y. Their interests and those of the Richmond Stove Company with the trade in the vicinity of New York are cared for by A. S. Mappett.

THE J. L. MOTT IRON WORKS, 84-90 Beekman street, New York, and 311-313 Wabash avenue, Chicago, have been so successful with their line of Sunray hot water heaters, Nos. 22 to 25, that they have just added two sizes to their list—Nos. 26 and 27. These heaters are used extensively for supplying water for hotels, apartment houses, and for heating small houses, are of modern construction and have grates that are perfect in operation. They report that the larger sizes of the Sunray hot water heaters, Nos. 1 to 12, are meeting with a very favorable reception.

THE UNITED STATES HEATER COMPANY, Detroit and Chicago, send out advertising cards of the pictorial sort, calling attention to the Capitol and Hecla heaters of their manufacture. The design in this instance is a Capitol heater on which sits, perhaps a traveling salesman, blindfolded like Justice, and holding scales suspended from his right hand, with which to weigh the advantages and defects of different constructions of boilers. Down either side of the central figure are ranged the advantages and defects of both cast and wrought iron, the intimation being that the defects are absent, and the advantages present in the Hecla and Capitol heaters.

THE AMERICAN RADIATOR COMPANY, 111-113 Lake street, Chicago, have lately received a large order for Excelsior indirect radiation to be shipped to Newcastle-upon-Tyne, England.

THE MASTER STEAM AND HOT WATER FITTERS of the State of Michigan, held their annual meeting February 28, at Grand Rapids. The annual election resulted in choosing the following officers for the current year: President, C. W. Light, Saginaw; secretary, J. A. Wheeler, Kalamazoo; treasurer, James Meathe, Detroit. The only important matter considered by the delegates was the question of becoming allied with the National Association. After some discussion it was decided to take a membership in the national body. The president deferred the appointment of an Executive Committee until a future time. This association will hold its next State meeting at Bay City with the master plumbers.

AT A MEETING held recently of the National Hot Water Heating Company, the following officers were elected: George E. Downe, president; Daniel Simonds, vice-president; William H. Oakes, secretary, and Frank G. Webber, treasurer

PETZOID & HARTUNG, 708-710 East 167th street, New York, are the agents for the bronzes made by Leo Haenle, Munich, Bavaria. In addition to a varied line of radiator bronzes in different colors they are offering an aluminum bronze, which, it is claimed, is superior to silver bronze in both brilliancy and durability, and is not affected by heat.

A Detroit millionaire will, it is stated, establish a co operative colony.

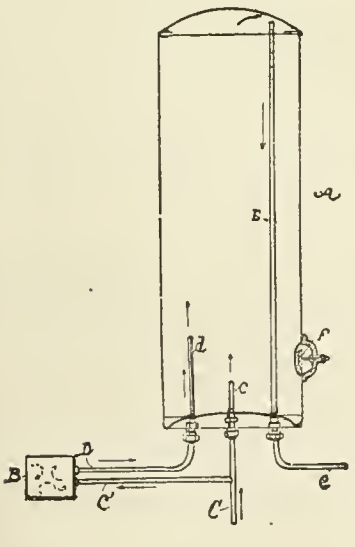
PLUMBING and GAS FITTING.

Michigan State Plumbers.

At the convention of master plumbers of the State of Michigan, at Grand Rapids, February 27 and 28, the president, James Meathe, in his address, recounted the benefits that had resulted from co-operation, and reported an increase of 500 members in the National Association since the Milwaukee Convention. The passage of a State law to regulate plumbing was discussed, after which the following officers were elected: President, James Meathe, Detroit; vice-president, S. J. Wirtz, Jackson; treasurer, John A. Wheeler, Kalamazoo; secretary, F. C. Bennett, Lansing; assistant secretary, Benjamin F. Guiney, Detroit. Executive Committee, W. C. Weatherly, Grand Rapids; J. Bradley, Port Huron; J. H. Crumley, Detroit. Sanitary Committee, J. H. Crumley, Detroit; Robert Sproul, Grand Rapids; Wm. W. Armstrong, Lansing. Legislative Committee, Robert Sproul, Grand Rapids; F. Schriver, Grand Rapids; S. J. Wirtz, Jackson. Apprentice Committee, F. Hutzel, Ann Arbor; Frank Walsh, Detroit; W. H. Sullivan, Bay City. The next State convention will be held at Bay City.

The Norristown Range Boiler.

The Norristown Range Boiler Works of 416 Walnut and 501 Chestnut streets, Philadelphia, Pa., are putting on the market the range boiler shown in the



The Norristown Range Boiler.—Sectional View.

accompanying cut. The boiler is claimed to possess the following advantages: It has no holes for connections on top; no pipes appear on the outside of the boiler; three pipes only are used instead of four, as in the case of the ordinary boiler, a saving of material and labor in making connections; it may be located in positions not suited to the ordinary boiler. The cold water pipe C enters the bottom of the boiler and extends upward 6 inches. The cold water supply to water back B is taken from pipe C. The circulating pipe D enters the boiler at bottom and extends upward 24 inches. The hot water delivery pipe E extends to within 2 inches of top of boiler. F is a hand hole for cleaning out sediment.

A Reinforced Lead Pipe.

A new style of lead pipe is illustrated in the London *Ironmonger* and reproduced here. It has been patented by G. Wakefield Fox, 104 Dickenson road, Rusholme, Manchester, England, and

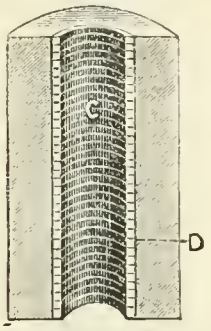


Fig. 1.—Coil on Inner Surface of Pipe.

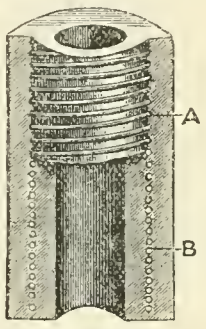


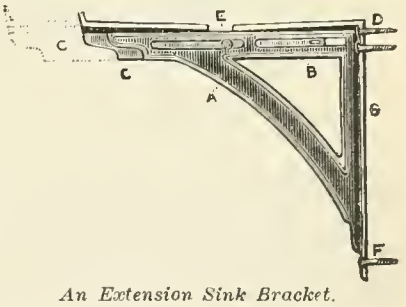
Fig. 2.—Coil Imbedded in Pipe.

A REINFORCED LEAD PIPE.

consists of a lead or tin pipe with an internal coil of round or square wire either partly or wholly imbedded in the walls of the pipe, as shown by the illustrations, Figs. 1 and 2. It is claimed that the quantity of metal used can be reduced and the pipe yet be stronger, and that the pipe furthermore can be readily bent without collapsing. This pipe may be made with a lining of tinned iron or copper wire, to take the place of tin lined pipe. In the process of manufacturing this form of piping the wire, which, for general purposes, is tinned iron or steel, is run off a reel, or otherwise, above and down the center of a revolving hollow mandrel, coming out at the bottom through an eye or aperture in the side at the junction of the mandrel and the core, and as the metal is pressed through between the die and the core it carries the wire with it in regular coils, fed from the revolving mandrel, the wire becoming imbedded in the walls of the pipe as it is being made. By varying the position of the eye in the revolving hollow mandrel, the wire may be either wholly or partially imbedded in the walls of the pipe, and the revolving mandrel may be applied to cylinders, having either upward or downward pressure. The piping can be cut by a fine saw. Cross joints are made by cutting the lead down to the wire, then filing through with a round rough file, and end joints by paring one end on the outside and the other on the inside down to the wire, then cutting the latter through in three places with a narrow fine saw or edge file, and forcing the pipe open with a plug.

An Extension Sink Bracket.

James Gray, East Albany, N. Y., has patented an extension sink bracket, shown in the illustration. It can be adjusted to fit any size of sink from 14 x 20 to 20 x 40 inches, and is arranged to meet irregularities in the shape of the bottom of the sink and to hold the sink securely in place. The bracket has an extension slide which is provided with lugs which work in slots in the bracket, and the two parts are secured at any point desired by a bolt. The bracket is provided with four screw holes at the top, to enable it to be securely fastened. In the cut, E shows the bracket partly extended, and the dotted lines C show it fully opened. A and B show the slots for the lug and bolt to work in, and D and F show the location of the screw holes in the back G. A variety of ornamental cast iron sink and slab brackets in one piece are also made by Mr.



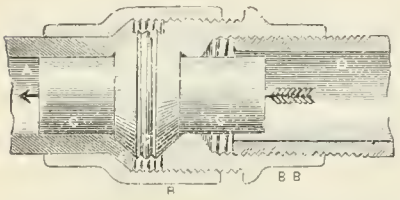
An Extension Sink Bracket.

Gray, and his line of goods is sold by the plumbing supply house of C. Hoffman, Jr., 281 Pearl street, New York.

THE SHORT TIME REQUIRED for erecting a stack of wrought iron house drain, where everything is convenient, is shown by the work of the men of Rossman & Bracken, plumbers, of 387 Lexington avenue, New York. In a 13-story building on Maiden Lane a stack 180 feet in hight was put up in less than two days. With cast iron pipe, more than twice as much time, it is said, would have been necessary.

Star Water Back and Boiler Coupler.

The accompanying illustrations show a water back and boiler coupler, put on the market by the Star Coupler Company, 801 Wainwright Building, St. Louis, Mo. Sectional views of the coupler are shown in Figs. 1 and 2,



Star Water Back and Boiler Coupler.—Fig. 1.—Sectional View Through Lead to Iron Coupling.

the former illustrating its application to lead and iron pipe, and the other showing how it is used to join two ends of lead pipe. Fig. 3 is the swedging tool and Fig. 4 is the grasping and bending tool used in the application of the coupler. Referring to the let-

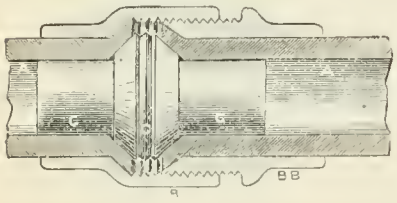


Fig. 2.—Sectional View through Lead to Lead Coupling.

ters on the engravings, A is the lead pipe and B the female part of the coupling, while B B is the male part of the coupling. C is the tubular cone, with gum washers, and D the iron pipe. In connecting iron to lead pipe the lead pipe is cut and bent to fit the connec-

Fig. 3.—Swedging Tool.

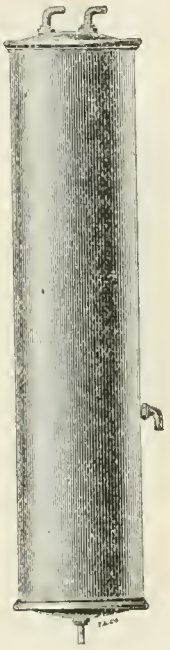
tions and each end trimmed out slanting by about one-half its thickness with tap borer or knife. The female parts of the couplings B are passed over the lead pipe A, and then each end of the pipe is swedged, the tubular cone and gum washers C being placed between the

Fig. 4.—Grasping and Bending Tool.

swedged ends of the lead pipe A and the male coupling B B. Next the male and female couplings are brought together to start the threads; then by means of a monkey wrench a complete joint is securely formed. The ends of the male part of lead to iron couplings, B B, are of standard size, with screw threads cut on the inside for direct connection to all the sizes of water backs and secured to boilers by the use of proper size of nipple or spud. These couplings do away with the necessity of soldering or wiping joints and make, it is claimed, absolutely air and water tight connections. The lead to iron couplings are made for $\frac{5}{8}$ and $\frac{3}{4}$ inch lead and $\frac{3}{4}$, 1 and $1\frac{1}{4}$ inch iron pipe, while the lead to lead couplings are made for $\frac{5}{8}$ and $\frac{3}{4}$ inch pipes.

The Resisto Range Boiler.

We show in the accompanying illustration a general view of a range boiler put on the market by the Booth Copper



The Resisto Range Boiler.

Company, Toronto, Canada. This boiler, which is made of copper, is specially designed to stand a high pressure, up to 200 pounds, and at the same time be reasonable in price. The feature of it is the method of fastening in the heads, no rivets being used. The boiler head is made of sheet copper, having an upwardly projecting edge. The head is fitted into the cylinder and pressed down about $\frac{5}{8}$ inch, the projecting part of the cylinder being turned over, squeezed against the head flange and soldered. After this joint is pressed down a malleable iron ring with a groove in the bottom forces the joint tightly together and holds it against the internal pressure of the boiler. This ring also takes all strain from the soldered joint, and, it is claimed, gives the boiler the strength to withstand at least 200 pounds hydraulic pressure. This special feature of the boiler is covered by United States and Canadian patents. The boiler is also strengthened on the inside to prevent collapsing from vacuum. At present the Resisto boilers are made in the 30-gallon size.

THE PLUMBING ORDINANCE of Holyoke, Mass., has been printed in pamphlet form with Chapter 477 of the statutes which governs the licensing of plumbers. Inspector Joseph Murray has been supplied with all of the blanks and books necessary for keeping the records required. He is examining the plumbing in tenement houses and having some necessary changes made.

New Hampshire Master Plumbers.

At the annual convention of the New Hampshire master plumbers, at Manchester, February 22, President Robert J. Donnelly made the opening address and introduced National President D. G. Finnerty. The principal business was the consideration of the proposed State plumbing law. The following special Legislative Committee was appointed to advance the interests of the proposed law: Robert J. Donnelly and J. Davis of Keene, P. Clifford of Concord, and H. Wolfe and F. A. Lane of Manchester, J. P. Sweetzer of Portsmouth and F. O. Ray of Nashua. President Donnelly suggested that the State be divided into four sections, owing to the distance that some members had to travel to attend the meeting, and further suggested that sectional meetings be held monthly and State meetings semi annually. The suggestions were considered and adopted.

The following officers were elected to serve for the ensuing year: President, Frank Lane, Manchester; vice-president, P. Clifford, Concord; financial secretary, Jno. F. Larkin, Manchester; recording and corresponding secretary, Frank Lessard, Manchester; treasurer, H. R. Pike, Manchester. The following were elected delegates to attend the twelfth annual national convention in Detroit, June 19, 20 and 21: Frank Lane, F. Lessard, P. Clifford. The convention adjourned to meet in Portsmouth on May 30, 1894.

TRAPS AND VENTS.

KEITH & FLACK, plumbers and steam fitters, Shelbyville, Ind., report that they have had a successful year and are now going into larger and better quarters, and expect to do well in 1894.

T. W. CULLEN, who has been engaged in the stove and plumbing business on Felton street, Waltham, Mass., for 15 years, has removed to the new Buckley Block, Moody street.

COL. W. T. MCGURRIN of the plumbing house of Sproul & McGurrin, Grand Rapids, Mich., acted as toastmaster at the Grand Rapids plumbers' convention. Robert Sproul of the same house, in a humorous speech, stated that he had frequently removed quantities of diamonds from waste pipes that were reported to be stopped and in every case returned them to the owner.

JAMES SULLIVAN, Newton Centre, Mass., intends to open a plumbing establishment

W. R. WILDER, bookkeeper for Parsons & Sears, and James Collins, a plumber employed by that firm, have leased the Fenn street store vacated by H. W. Partridge and will start a new plumbing establishment at Pittsfield, Mass.

THE FIRM of Dunwoody & Collins, plumbers, Waterford, N. Y., have dissolved by mutual consent. Mr. Collins will continue the business.

WILLIAM H. ASH has begun the erection of two three-story frame buildings at the corner of Briggs and Atlantic avenues, Clarenceville, N. Y. They

will have stores on the first floor and living apartments overhead. Mr. Ash will occupy one of the stores for his plumbing business.

GEORGE H. MCCALMON & SON, plumbers, have opened a shop in the rear of 212 Main street, Biddeford, Maine.

DAVID W. YARBOROUGH is reported to have bought the entire stock of Stockton & Kuhrt at Atlanta, Ga., and moved it to his establishment at 18 East Hunter street.

ONE OF THE ECHOES of the Grand Rapids, Mich., plumbers' convention in reference to bad plumbing was that "real estate sharks, who wish to realize 50 per cent. upon their investments, cut their plumbing bills down by putting in inferior work, to the great detriment of the occupants."

PLANS AND SPECIFICATIONS have been prepared for the enlargement of the S. H. Beard Heating & Plumbing Company's building, on Arch street, New Britain, Conn.

EDSON L. CLARK has opened a plumbing establishment at 77 Second street, Newburg, N. Y.

THE SYSTEM of Instructor Walmsley with the lead burning class at the New York Trade School has been so successful that an effort is being made by some who did not take this course to have him take another class at the close of the school. The instructor is highly gratified with the work of the young plumbers, who can show some masterpieces of workmanship.

PRICE BROS., Macomb, Ill., will move their plumbing and electric fixture establishment to Oakman & Clugsten's furniture store, where they will occupy a portion of the building.

THE A. Y. MCDONALD COMPANY, 168 Lake street, Chicago, have arranged with the Henry Huber Company of New York to handle all the plumbing specialties manufactured by the latter company, exclusively in the States of Michigan, Indiana, Illinois and Wisconsin and all territory west of the Mississippi River. The Henry Huber Company will discontinue their supply house at 231 East Kinzie street, and all of their goods will be carried by the A. Y. McDonald Company, who are to make extensive alterations in their store, including the fitting up of an elegant showroom.

THROUGH the courtesy of Secretary James T. McNab of the Master Plumbers' Association of Passaic County, N. J., we receive the following list of officers elected at a recent meeting at Paterson, N. J.: President, John Hickman; vice president, John Quinn; treasurer, E. W. Blair; secretary, James T. McNab; sergeant-at-arms, T. J. Brogan. Trustees: M. Nealon, Chas. Walls and Thomas Wilson.

THE VALUE of tight plumbing fixtures in houses when a drought affects the source of a water supply was shown in a very plain way at Northampton, Mass., last summer, says the superintendent of the water works. The city has a gravity supply which has been adequate for its needs until the summer of 1893, when the greatly diminished rainfall and increased consumption of water combined to reduce the storage to a dangerously small quantity. The superintendent investigated the matter and found that the city was using and wasting more water than others similarly situated, so a house to house inspection of the fixtures was made and leaks were stopped. He states that this resulted in reducing the consumption possibly one-half and increasing the pressure about 20 pounds at the hydrants.

THE STORE at 78 Union street, Portland, Maine, recently vacated by J. M. Fox, electrician, is now occupied by Myers & Mahoney, practical plumbers, who are prepared to do all kinds of work in their line. They make a specialty of bending brass piping.

WELLS BROTHERS & COMPANY, Greenfield, Mass., make a specialty of stay bolt taps. They make any size desired and keep in stock a large variety of sizes and lengths made in the following proportions: one-third reamer, one-sixth taper, one sixth thread and one-third shank.

FINDEISEN & KROPF succeed Durfee & Findeisen, manufacturers of plumbers' wood work supplies, 132–134 West Lake street, Chicago. J. A. Durfee retires, his place in the company being taken by O. F. Kropf.

THE CITY OF ROME, GA., is remodeling and adding to its ordinances for local government. Among the additions is a plumbing ordinance, which is said to go into minute details and provide a better sanitation. An ordinance in drainage and sewerage is being elaborated to provide for a better system for the disposal of waste.

CHARLES H. DELOID, who up to the time of closing of the establishment of Davis & Co. was foreman in their plumbing department, has opened a plumbing establishment at 1 Water street, Gloucester, Mass.

PECK BROTHERS & CO., 259 Wabash avenue, Chicago, are getting out their new closet repair coupling, and at present are unable to supply the demand. The plumbers speak very highly of the device.

New York State Master Plumbers.

The sixth annual convention of the Master Plumbers' Association of the State of New York was called to order on March 6, at Buffalo, N. Y., by President Chas. Geiger, at the Builders' Exchange, a large number of delegates being present. After a short speech he introduced the Mayor, who addressed the convention and extended to them the freedom of the city. James S. Stygall, president of the Buffalo Association of Master Plumbers, reiterated the welcome, as chairman on entertainment. National President Daniel G. Finnerty then made a speech, in which he pointed out that one of the main duties of the association was to educate those in the trade who were not qualified to do good work, and he urged the bringing in of all master plumbers, so that all could receive the advantages of association. Mr. Finnerty referred in touching terms to the recent death of a member of the Executive Committee of the National Association, James G. Welden of Pittsburgh, and later resolutions of condolence were passed and ordered to be sent to the bereaved family.

John Mitchell of New York, vice-president of the National Association, also spoke, dwelling upon the high aims that should be pursued by the master plumbers. He urged the securing of laws that would bring about the best kind of inspection of plumbing work—inspection by skilled plumbers—and he urged the securing of laws that would punish plumbers for doing improper work.

A Credential Committee was appointed, who in their report showed a membership of 768, an increase of 45 since the last convention. Representatives from the Journeymen's Union were received, who asked for action to reduce the number of apprentices, and after some discussion on the subject it was referred to the Committee on Laws and Legislation. The Sanitary Committee reported that great progress had been made in sanitation, and that the advance still continued. The Committee on Legislation reported that several objectionable measures had been shelved in the Legislature through their efforts, and that some equally unwise were now pending that would be carefully watched. The treasurer's report showed the association in good financial condition, and recommendations to strengthen it were discussed and favorable action taken. On the third day of the convention the annual election was held, Mr. Geiger declining re-election. The following officers were elected:

President, William J. McDermott, New York.

Vice-president, Henry E. Weiber, Kingston.

Recording secretary, Charles Schloesser, New York.

Financial secretary, Horace F. Westcott, Albany.

Treasurer, William Reid, Rochester.

Delegates at-large to State Convention, Messrs. Callahan of Jamestown; Barnes of Troy, Collins of New York. Delegates-at-large to National Convention: J. A. Rossman of New York and Charles Geiger of Buffalo.

The constitution was amended to a slight extent and Troy was selected as the next convention city. During the convention theater parties, drives, a reception by the Knights of Tobasco, and a banquet, at which James S. Stygall acted as toastmaster, gave the visitors a lasting impression of Buffalo hospitality.

"Knights of Tobasco."

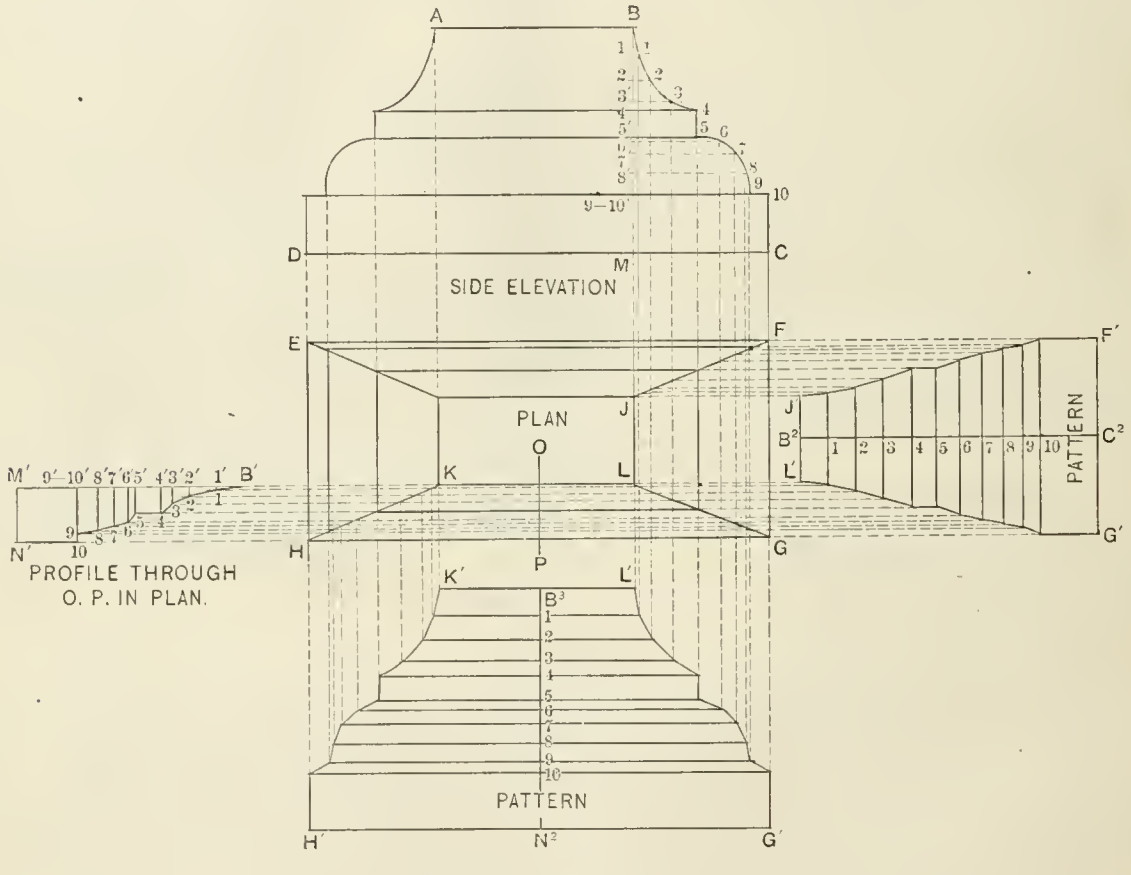
While the convention of master plumbers was in session at Buffalo the Knights of Tobasco became a permanent institution, holding two sessions and adopting a constitution. The officers are curiously styled as follows: President to be called "Old Pepper;" vice-president, "Young Pepper;" secretary, "Black and White Pepper;" treasurer, "Red Pepper;" directors, "Mixed Peppers." "Tobasco" means "hot stuff," and the name was suggested by the "father" of the order, genial Tom Cushing of New York. The Knights have adopted two series of yells, and if you can't see the Knights you can hear them. The yells are "T-o-b a s-c o. Hot stuff. Hot stuff. Oh! oh, oh," and "Who are we? Who are We? Knights of Tobasco, can't you see?' About 75 delegates were in attendance. The membership is restricted to traveling men connected with the plumbing, steam, gas and water fitting trades. It was resolved to meet in Troy next year, at the same time the master plumbers meet. The election of officers resulted as follows: Old Pepper, Thomas F. Cushing, New York; Young Pepper, D. M. Davidson, New York; Black and White Pepper, Louis W. Gay, Buffalo; Red Pepper, Robert T. Eddy, Buffalo; Board of Mixed Peppers, Charles S. Siddons, Buffalo; D. L. Hamill, Albany; Philip Becker, Syracuse; John J. Cary, Baltimore; Frank J Rourke, New York.

ROOFING AND CORNICE.

Pattern for Molded Base.

From P. S., *Moberly, Mo.*—Please publish in *The Metal Worker* pattern for a rectangular molded base, the molding of the sides being similar to that of the ends, but having less projection.

Answer.—Let A B C D in the cut represent the side view of the base and E F G H the plan. B C and A D show the profile of the ends of the base. As the projection through the sides of the base is less than that of the ends, a profile must be obtained through the side O P in plan, from which to obtain the stretchout in producing the pattern of sides. To obtain the pattern for the end proceed as follows: Divide the profile B C into an equal number of parts, as shown by the small figures, and from the points obtained drop lines at right angles to A B until they intersect the miter lines J F and L G in plan. At right angles to F G draw the line B^2 C^2, upon which place the stretchout of the profile B C, as shown by the small figure, through which draw the usual measuring lines, which intersect with lines of corresponding numbers drawn from the miter lines at right angles to F G. A line traced through these intersections, as shown by J′ L′ G′ F′, will be the required pattern for the end of the base. To obtain the profile through the side proceed as follows: From B in elevation draw the vertical line B M, as shown, and from the divisions on the profile B C draw lines parallel to the lines of the moldings until they intersect the line B M, as shown by the small figures. From the intersections obtained on the miter line L G in plan, as before explained, draw lines parallel to H G indefinitely, cutting the miter line K H, as shown. In line with K L of the plan draw the line B′ M′, in hight equal to B M of elevation, and transfer the spaces from B M to B′ M′, as shown. At right angles to M′ B′ and from the points on same draw lines as shown, intersecting lines of corresponding numbers drawn from the miter line L G. A line traced through these intersections will be the desired profile through the side of the base. To obtain the pattern for the side proceed as follows: At right angle to H G draw the line B^3 N^2, upon which place the stretchout of the profile B′ N′, as shown by the small figures. It will be noticed that the spaces in the profile B′ N′ are of unequal distance, and must each be separately placed on the line B^3 N^2. Through the points in this stretchout line draw the usual measuring lines, as shown, which intersect with lines of corresponding numbers drawn at right angles to H G from the miter lines K H and L G. A line traced through these intersections, as shown by K′ H′ G′ L′, will be the desired pattern for the side.



Pattern for Molded Base.

Lyles & Mills of 231 William street, New York City, send us a copy of their enlarged catalogue of decorative metal ceilings. Within the colored paper covers of the publication some of the advantages of the use of metal ceilings over plastered work are given; also directions for putting up metal ceilings, together with illustrations showing their appearance when finished. The manufacturers have added new styles of plates, to which special reference is made in the catalogue. A number of designs of ceilings are presented, together with interior views of some of the buildings in connection with which work has been done. The firm state that they keep constantly in stock different styles of plates and moldings and can promptly fill orders with which they may be intrusted.

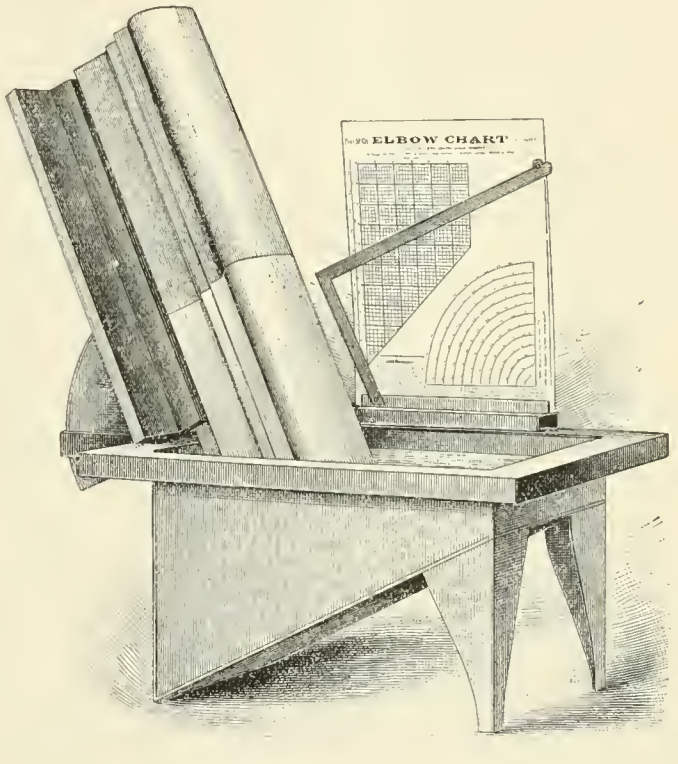
Water Line Patterns.

A year or more ago, our readers will remember, we illustrated a very complete chart devised by A. L. Burtis of Lockport, N. Y. Another application of this art is shown in the accompanying illustration and the following description of its use is taken from a letter received from Mr. Burtis:

As many of your readers are using my elbow chart, I send you a picture of a machine by which I make patterns for elbows or cornice miters when I want a pattern that is absolutely correct and want it quickly. It is the old water line method that I employ, brought down to an intelligent basis. By the use of a chart I can make 100 different patterns in one hour, and be able to write on each one just what it will make in two or more pieces when put together, and I don't know of any other way but this in which it can be done. The tank, of galvanized iron, is large enough to use for 12-inch patterns, being about 18 x 13 x 12 inches deep at the hinged end. I make it of the shape shown so as to require as little water as possible and do the business. I have tin cylinders made about 24 inches long of the different sizes of pipes, and just large enough to receive a paper covering so the edges will meet without any allowance for locks. To produce a pattern of 10-inch elbow, say in four sections of 84° angle, I set the bevel on the chart at one-third that number of degrees, or 28°. I then set the inclination to correspond with the bevel on the chart, slide the paper covered cylinder of that diameter down into the water, take it out and get the pattern while the water line shows plainly. If I have a piece of molding for which I want a miter, I wet one side, set the inclination by the chart, slide it into the water, and in less time than it takes to tell it I have an excellent pattern. Heavy building paper is just the thing for the elbow patterns and is cheap. The square I use on the chart is made of tin about ½ inch wide with a pin through the chart, and is arranged so as to bring the upper edge on a line with the point A. The arc back of the plane is also made of tin with holes through which a small nail is passed to hold it at any desired angle, the arc running through a slot made of hoop iron that is fastened to the back edge of the wooden frame.

I would suggest the importance of having the apparatus set perfectly level. This may be accomplished by making a water line all around, about 1 inch from the top, which will serve to level it by when filled up to that line. Another point which should be observed is to hold the cylinder or piece of molding perfectly true and upright, a gauge being fastened to the inclination for that purpose. Vertical lines should be drawn on the paper at each quarter of the circumference before wrapping around the cylinder, so that the pattern will be equally divided, and prick marks can be made on the pattern, which serve as a guide when putting the sections together. Then if a fish tail pattern is desired in four or more pieces, the seam on the paper will be held on one side, bringing the first quarter mark in front, while for a three-piece elbow, the seam would be held in front. In setting the inclination by the chart, follow the directions the same as if the pattern was to be drawn with a pencil. For a right angle four-piece elbow the upper line of the tin square would be set at 30° on the upright scale on the chart and the incline set parallel with the short arm of the square. The long arm of the square is held up by a hook made of tin, that slides on the top edge of the chart, and which admits of accurate adjustment. The chart is set on edge in a block of wood 2 inches wide by 10 inches long, and slides back and forth on the wood support. All of the parts are of the simplest construction, and can be quickly and cheaply made by any one desiring the most perfect pattern making device in the world for elbows.

Bowers, Galpin & Co., Binghamton, N. Y., publish circulars relating to their conductor pipe. One of these circulars shows illustrations, general and sectional, of their standard patent expanding galvanized conductors, which



Water Line Patterns.

are made square, chamfered and octagon, and of copper or galvanized steel. Similar illustrations are also presented of their heavy riveted expanding conductors for large buildings and which likewise are made square, chamfered and octagon. These conductors are made of 20, 22 and 24 galvanized steel and copper, strongly riveted, in 8 and 10 foot lengths without cross seams and with expanding lip from 1 to 1½ inches wide. They are made for business blocks, railroad and public buildings, and other places requiring heavy, strong conductor pipe.

Pen portraits of distinguished people are always entertaining and we therefore believe that many of our readers will be interested in the following sketch of a certain traveler in the tin plate trade. The portraiture is furnished us by a correspondent, who received it in a letter from a friend: "His appearance is striking in the extreme. He was 'set' behind a large diamond which gleamed in his bosom and reminded me forcibly of the description of the inhabitants of the Hall of Eblis in 'Vathek,' who, as you will remember, are described as having burning coals in their bosoms. His clothes were of unusual cut and a pattern nearly as pronounced as his manner. He swaggered about the store with a peculiar easy elegance and leered at our lady typewriter like a tailor-made satyr. He was pleased to patronize me in a very marked manner, and noticing I was English, he addressed me in a very bad imitation of the accent of the cockney costermonger, I suppose he intended it as a delicate compliment and I was sorry I could not return his civility by replying in a torrent of profanity in a nasal twang, *à la* American 'tough.'"

The North of England settlement of coal miners in the Monongahela Valley is said to be becoming depopulated by the departure for home of the Scotch families located there, of which some 40 have already departed, while others are on the point of leaving. The movement is caused by the recent severe reduction in wages, whereby they have been brought down to a lower rate than the miners could earn at home.

The Legislature of San Luis Potosi, Mexico, have decreed the exemption from all taxation of new industries locating in that district. The ordinance provides that all such industries established within the next five years shall be free from taxation for a term graduated according to the amount of the investment. It is hoped to stimulate the investment of foreign and especially American capital in the lands and mines of the State of San Luis. This example will, it is believed, be followed by other States of the Mexican Republic.

Accidents in and about coal mines in Great Britain during 1893 caused the death of 1056 persons, an increase of 40 over the record for 1892.

Work on the new cable between Nova Scotia and the coast of Ireland will be commenced shortly. The cable will be 2200 miles long.

THE TIN SHOP.

Pattern for Article Oblong to Round.

From G. M. L.—How is the pattern to be described for an article oblong to round, the round top to be tangent to oblong base at side and end? For example, the oblong base to be 20 x 51 inches, and the round top 32 inches in diameter.

Answer.—In Fig. 1, let A B C D represent the round top in plan, and F G H J the oblong base. The top is struck from E as center. In Fig. 2 the plan is shown in connection with the side and end elevations. For convenience in describing the pattern, divide the plan of top into four equal parts, as indicated by the lines A*a* C*a* B*a* D*a*, drawing A*a* C*a* through the center E*a*, and parallel with F*a* G*a*, also drawing D*a* B*a* through the center E*a*, at right angles to A*a* C*a*. Also connect J*a* D*a* H*a* and H*a* C*a* G*a*. The plan being thus divided, we can see that there are four sections of oblique cones in the article, as A*a* F*a* B*a*, B*a* G*a* C*a*, C*a* H*a* D*a* and D*a* G*a* A*a*. The sides and ends are in the form of triangles. Thus the side J*a* D*a* H*a* is shown in elevation by J*b* D*b* H*b*, and indicated in end elevation by J*c* D*c*. J*b* D*b* H*b* of side elevation is the exact shape of F*a* B*a* G*a* of plan, which is indicated in end elevation by F*c* B*c*. The exact shape of J*a* A*a* F*a*

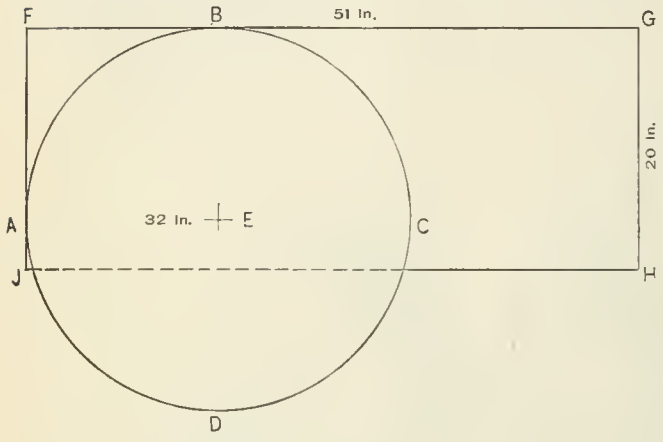


Fig. 1.—Plan Indicated by "G. M. L."

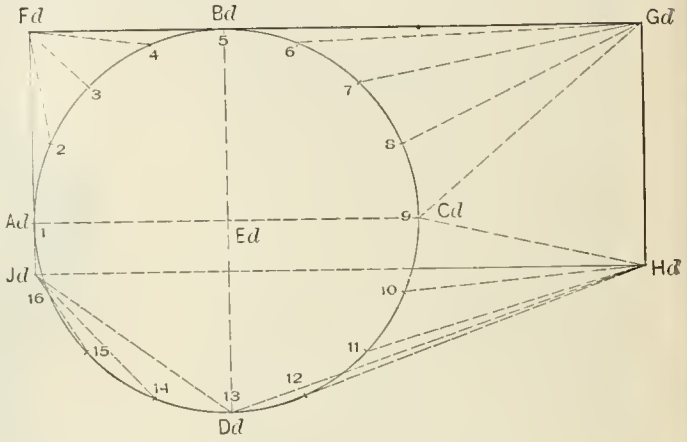


Fig. 3.—Base Lines of Triangles Drawn on Plan.

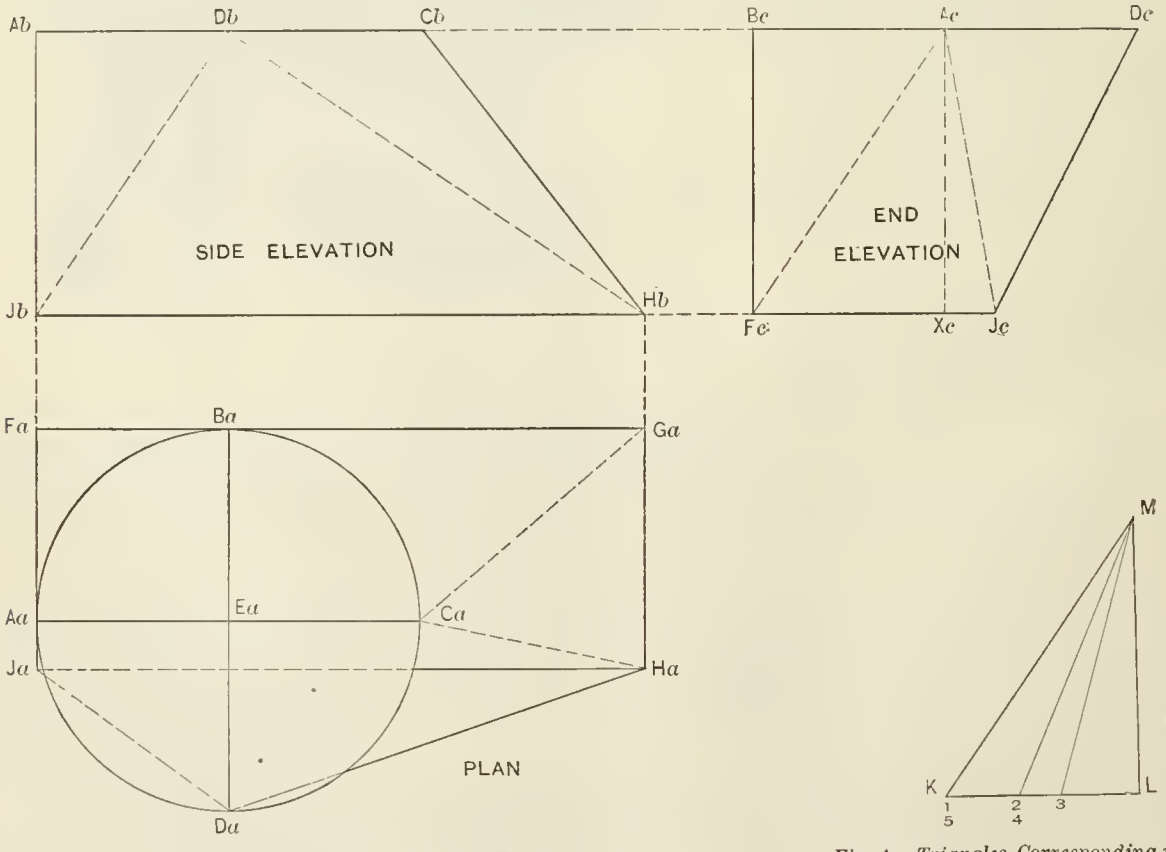


Fig. 2.—Plan, Side and Front Elevations.

Fig. 4.—Triangles Corresponding with Lines in Ad Fd Bd of the Plan.

PATTERN FOR ARTICLE OBLONG TO ROUND.

is shown in end elevation by F*c* A*c* J*c*, and indicated in side elevation by J*b* A*b*. The remaining end is shown in plan by H*a* C*a* G*a*, and indicated in side elevation by H*b* C*b*.

While the elevations are convenient in enabling one to understand the shape of the article, in the present instance they are not necessary in describing the pattern when the operation is performed by triangulation, the hight of the article being known. For the purpose of obtaining the base lines of the triangles divide the plan of the top into any convenient number of equal parts, as indicated in Fig. 3 by the small figures. Thus A*d* B*d* is divided into four parts, and from the points thus obtained lines are drawn to F*d*. As A*d* F*d* B*d* is part of an oblique cone we will construct a diagram of triangles whose bases are equal to the length of lines drawn from A*d* B*d* to F*d*. The altitude of these triangles will be equal to the hight of the article, so their hypotenuses will give the distances from F*d* in the base to the points in A*d* B*d* of top. We will pursue a similar course with the other sections. That a confusion of lines may be avoided, a diagram of triangles has been constructed for each of the parts of oblique cones, as shown in Figs. 4 to 6.

For the diagram of triangles in Fig. 4 proceed as follows: Draw any line, as M L, in length equal to the hight of the article. From the point L and at right angles to M L draw the line L K, and, measuring from L, set off the length of lines in A*d* F*d* B*d* of plan, Fig. 3. Thus L K is equal to F*d* A*d* and F*d* B*d*, and so on. From the points thus established in K L draw lines to the apex M. If the triangle M L 3 was placed with its base on F*d* 3 of plan its hypotenuse would give the distance from F*d* in the base to point 3 in the top.

The triangles in Fig. 5 are constructed in the same general manner. O P represents the hight of the article, as represented by J*b* A*b* of side elevation, and from O, on O N is set off the length of lines in B*d* G*d* C*d* of plan, and from the points thus obtained in O N lines are drawn to the apex P. The hypotenuses of the triangles in Fig. 5 thus represent the distances from G*d* of base to the points in top represented by the small figures. The triangles in Fig. 6 are constructed in a similar manner and correspond with the lines in C*d* H*d* D*d* of plan. When a pattern is to be described for any article it is well to first determine where the seam or joint is to be located. In the present instance the joint has been placed at A*d* in plan, Fig. 3, or as indicated by A*c* X*c* in end elevation. Accordingly the distance A*d* J*d* in plan has been set off from U in the diagram of triangles, Fig. 7, as indicated by U A. Then the hypotenuse A V represents the distance from the point J*d* in base to point A*d* in top. The remaining triangles in Fig. 7 are constructed in a

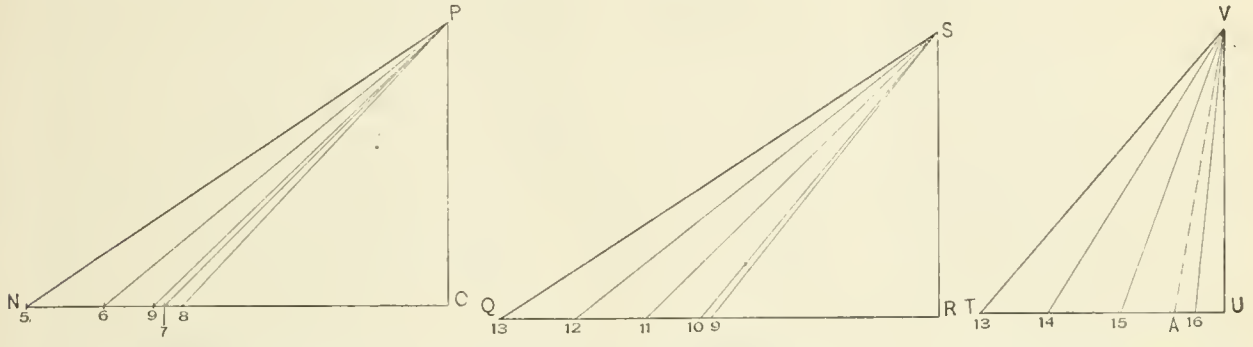


*Fig. 5.—Triangles Corresponding with Lines in B*d *G*d *C*d *of the Plan.*

*Fig. 6.—Triangles Corresponding with Lines in C*d *H*d *D*d *of the Plan.*

*Fig. 7.—Triangles Corresponding with Lines in D*d *J*d *A*d *of the Plan.*

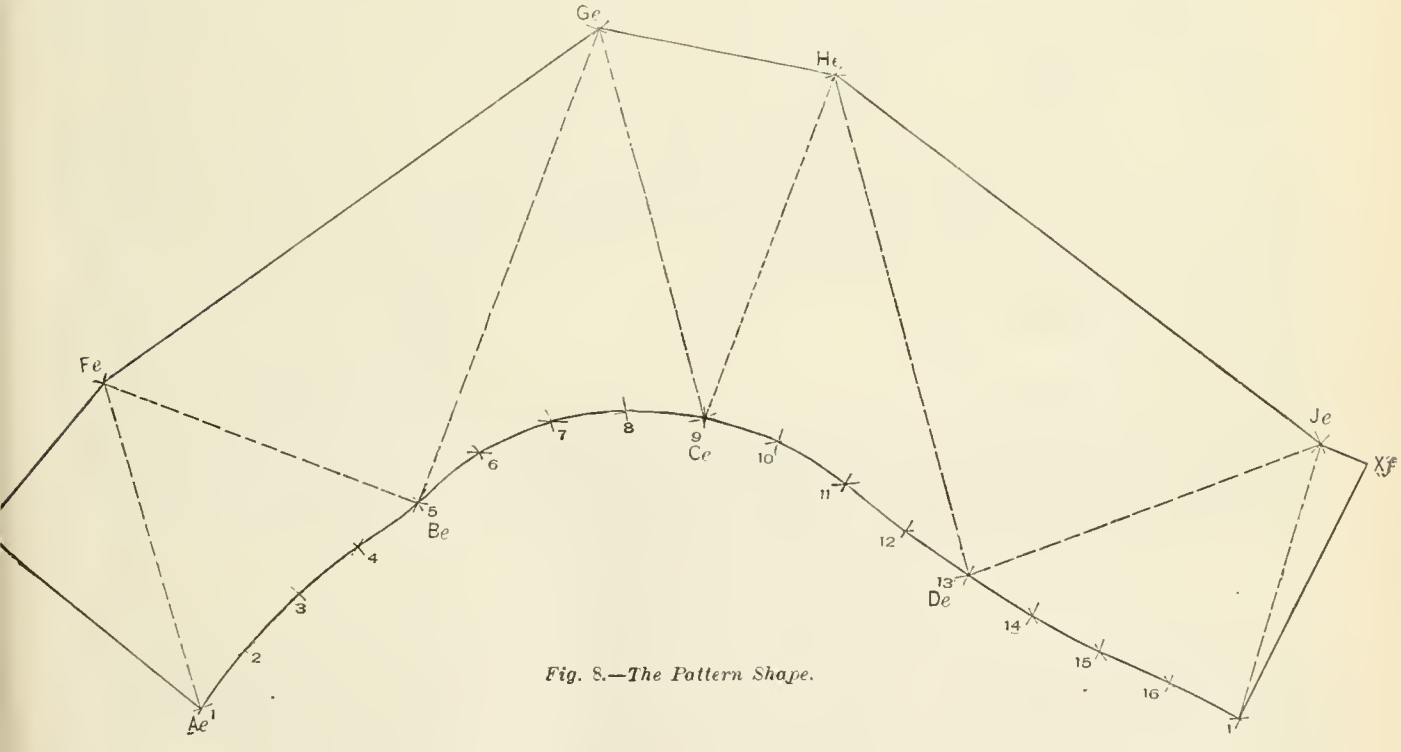


Fig. 8.—The Pattern Shape.

PATTERN FOR ARTICLE OBLONG TO ROUND.

similar manner and correspond with the lines in D*d* A*d* J*d* of plan.

For the pattern shown in Fig. 8 draw any line, as X*e* A*e*, in length equal to L M of first diagram of triangles, Fig. 4. With X*e* of pattern as center, and with A*d* F*d* of plan as radius, strike a small arc in the direction of F*e*, which intersect with one struck from A*e* as center, and M K of Fig. 4 as radius, thus establishing the point F*e* of pattern. Connect the points thus obtained, as shown. Then X*e* F*e* A*e* is the pattern of part of article shown in end elevation by X*c* F*c* A*c*, or indicated on plan by A*d* F*d*. With F*e* of pattern as center, and M 2 of Fig. 4 as radius, strike a small arc, which intersect with one struck from A*e* as center and the distance A*d* 2 of plan as radius, thus establishing the point 2 of pattern. Proceed in this manner, with the point F*e* of pattern as center, with radii corresponding to the hypotenuses of the triangles in Fig. 4, strike the arcs shown. With the dividers set to the same space as was used in stepping off the plan in Fig. 3, and commencing with point 2, step from arc to arc, as shown by the figures 2, 3, 4, 5. A line can be traced free hand through the points thus obtained, and the line F*e* B*e* drawn, as shown by A*e* B*e* F*e*. Then A*e* F*e* B*e* is the pattern for part of article shown on plan by A*d* F*d* B*d*.

With F*e* of pattern as center, and F*d* G*d* of plan as radius, strike a small arc, which intersect with one struck from B*e* of pattern as center, and P N of Fig. 5 as radius, thus establishing the point G*e* of pattern. Draw F*e* G*e* and G*e* B*e*. Then F*e* G*e* B*e* is the pattern of side of article indicated on plan by F*d* B*d* G*d*.

With the hypotenuses of the triangles in Fig. 5 as radii, and with G*e* of pattern as center, strike arcs as shown, and with the dividers set to the same space as was used in stepping off the plan, and commencing with B*e*, step from arc to arc, as shown by the figures 6, 7, 8, 9. Trace a line through the points thus obtained, as shown by B*e* C*e*, and draw C*e* G*e*. Then B*e* C*e* G*e* is the pattern of part of article shown on plan by B*d* G*d* C*d*.

With G*e* of pattern as center, and G*d* H*d* of plan as radius, strike a small arc, which intersect with one struck from C*e* as center, and with S 9 of Fig. 6 as radius, thus establishing the point H*e* of pattern. Draw G*e* H*e* and H*e* C*e*. Then G*e* H*e* C*e* is the pattern of part of article shown on plan by G*d* H*d* C*d*.

With H*e* of pattern as center, and with the hypotenuses of triangles in Fig. 6 as radii, strike arcs, as shown, and with the dividers set to the same space as was used in stepping off the plan, and commencing with C*e* of pattern, step from arc to arc, as indicated by the figures 10, 11, 12, 13. Trace a line free hand through these points, as shown by C*e* D*e*, and draw D*e* H*e*. Then C*e* H*e* D*e* is the pattern of part of article shown on plan by C*d* H*d* D*d*.

With H*e* of pattern as center, and with H*d* J*d* of plan as radius, strike a small arc in the direction of J*e*, which interaect with one struck from D*e* as center, and V T of Fig. 7 as radius, thus establishing the point J*e* of pattern. Draw H*e* J*e* and J*e* D*e*. Then H*e* D*e* J*e* is the pattern of part of article shown on plan by H*d* D*d* J*d*.

With J*e* of pattern as center, and with the hypotenuses of triangles in Fig. 7 as radii, strike arcs as shown, and with the dividers set to the same apace as was used in stepping off the plan, and commencing with D*e* of pattern, step from arc to arc, as indicated by the figures 14, 15, 16 1. Trace a line free hand through these points, as shown by D*e* A*f*, and draw A*f* J*e*. With A*f* of pattern as center, and V U of Fig. 7 as radius, strike a small arc in the direction of X*f*, which intersect with one struck from J*e* of pattern as center, and J*d* A*d* of plan as radius, thus establishing the point X*f* of pattern. Draw A*f* X*f* and X*f* J*e*. Then A*f* X*f* J*e* is the pattern of part of article shown on plan by J*d* A*d* and in end elevation by A*c* X*c* J*c*. It will be observed that A*d* of plan, Fig. 3, refers to similar points in base and top. In thus describing the pattern, points X*e* F*e* G*e* H*e* J*e* X*f* correspond with points A*d* F*d* G*d* H*d* J*d* A*d* of plan of base, as the points A*e* B*e* C*e* D*e* A*f* of pattern correspond with points A*d* B*d* C*d* D*d* in plan of top. As the net pattern only is shown, suitable allowances should be made about the edges for joining.

OBITUARY.

JAMES G. WELDON.

James G. Weldon, one of the best known residents of Pittsburgh, died at his home in the East End, in that city, on Friday morning, March 2. He was the senior member of the plumbing firm of Weldon & Kelly of 404 Wood street, and was an active member of the association of master plumbers, both national and local. It was while attending the national Executive Committee meeting of this association in Boston ten days ago that he contracted a cold which developed into pneumonia and caused his death. Mr. Weldon was born in Philadelphia in 1831 and came to Pittsburgh when a boy. He learned the brass molding trade and then entered the plumbing and gas fitting business, in which he had been engaged for 40 years. He was a member of the old Vigilant Volunteer Fire Company. For eight years he was a member of City Councils from the old Third ward, now the Fifth, and later represented the Fifteenth ward for five years. He was a member of the committees on water and streets when the present water works were started and the great improvements commenced. He leaves a wife, four sons and three daughters.

EATON, COLE & BURNHAM COMPANY, who last year went into the hands of receivers, have made a proposition to their creditors which contemplates payment in full, with interest, extending over a period of three and a half years. This offer has been accepted and the receivers, E. G. Burnham of Bridgeport, Conn., and E. H. Cole of New York, were, March 3, discharged by Judge Townsend of the United States District Court at New Haven.

SCRAP.

A WELL ATTENDED MEETING of the creditors of James B. Scott & Co., tin plate manufacturers, whose affairs were placed in the hands of James Collord, assignee, on February 13, was held in Pittsburgh on Tuesday afternoon, the 6th inst., at 3 p.m. It is understood that this meeting was only a preliminary one, and was for the purpose of giving the creditors a general idea of the condition of the affairs of the firm. A summary statement was presented, which showed that the liabilities of the firm would aggregate about $200,000, while the assets were given as considerably less than this amount. The statement was referred to a committee of three of the creditors, who will examine the accounts closely and call another meeting of the creditors when the report is ready. It is likely that this meeting will be held next week, when it is probable a proposition will be made to the surviving members of the firm by the creditors for the payment of the indebtedness of the concern. It is also probable that an effort will be made by which the business of James B. Scott & Co. will be carried on by the surviving members of the firm.

LYON, CONKLIN & CO. of Baltimore, Md., are putting on the market a roofing plate made of iron, under the name "Iron Old Way." This plate they claim is made from soft charcoal iron and carries a terne coating which is as heavy as it is possible to apply. It is claimed that the pores of iron being much more open than those of steel, the coating adheres better, thereby making the plate far less liable to rust. A sample section of a roof made of these plates has been subjected to a long exposure on a high roof surrounded by factory buildings, unprotected from the weather of the past winter, and upon examination no sign of rust or corrosion was apparent. The firm state that they are introducing the plate in response to numerous requests of architects and roofers, and after experiments extending over three years.

A. W. Brown, who recently purchased at assignee's sale the plant of the Ellwood Steel Company, at Ellwood, Pa., has contracted with the Leechburg Foundry & Machine Company of Pittsburgh for the necessary machinery to equip this plant for the manufacture of black sheets for tinning purposes. It is the intention to change the four sheet mills to four tin plate mills. There is also to be added an additional cold rolling mill, four doubling shears, two Mesta patent vertical squaring shears and one Mesta patent pickling machine. The plant, when completed, will be a modern four-mill tin plate plant and is expected to be ready for operations about April 1, with a capacity for producing about 25 tons of black sheets on three turns. The name of the concern will be changed in the near future to the Ellwood Tin Plate Company. It is probable that when the plant is in successful operation on the manufacture of black sheets for tinning purposes the necessary machinery will be added and tin and terne plates made.

THE RETAIL STORE.

Ice Cream Freezers.

The assortment of Ice Cream Freezers offered to the trade by the different manufacturers for the present season is substantially the same as last year, with the addition of one or two new Freezers and improvements in others. The manufacturers are giving their attention to improving the goods wherever there is an opportunity, especially in the way of more durable tubs, simpler and better protected gearing, easier methods of fastening and removing the gear covers and more thorough agitation of the cream. The following review of the market represents the Freezers offered by the leading manufacturers :

THE WHITE MOUNTAIN FREEZER CO.,

Nashua, N. H., are not introducing any feature especially novel this year in their Triple Motion White Mountain Freezers. The tubs are described as made of close grained, Northern grown, seasoned pine, bound with galvanized iron hoops, and after the tub is complete a chemical preparation is applied to make it absolutely water proof. The cans are made from a heavy grade of charcoal tin plate, all outside fittings are galvanized, and the gearing is completely covered. The dasher is of malleable iron, in two parts, which revolve independently of each other. The point is made that the cream is beaten all the time that the crank is turned, preventing the frozen cream moving around in the can and in the same direction. All inside parts are tinned. The company also make the Arctic Freezer, in the construction of which, it is stated, the same care is exercised in the selection of all raw material as for the White Mountain, and that no seconds are utilized in any way in the construction of the Arctic Freezer. It is explained, however, that the gearing of the Arctic being simpler enables the manufacturers to sell it at a much lower price than the White Mountain is sold for.

PEERLESS FREEZER COMPANY,

Cincinnati, Ohio, are manufacturing the Peerless, Giant and Zero Freezers for the coming season. The improvements in the line of Peerless Freezers make them, it is remarked, easier to run and absolutely salt water and oil proof. It is stated that the automatic vacuum dasher is so constructed that the cream is aërated, lightened and rendered free from granulation. The crank can be used on the top or side of the Freezer, and all parts are made to be interchangeable. The Giant Freezer is constructed on the same principle as the Peerless, only much heavier, and is designed for hotels, confectioners, boarding houses, &c. The Zero Freezer is referred to as full size and well made, having the gearing completely covered. The company's Freezers are made in sizes from 3 quart to 10 gallon.

THE SAMUEL C. TATUM COMPANY,

Cincinnati, Ohio, are offering the Ohio Freezer, Gooch's patent, in sizes from 2 to 25 quarts. The gearing is fully housed and so arranged as to prevent dirt or oil getting into the can. The shank of the dasher comes up through the housing, so that the crank may be used on the top or at the side. The can has a cast iron top with gearing on it (concealed under the housing) giving one motion to the can, while the reverse motion is given to the dasher. The dasher on one side has spiral projections, to thoroughly stir up the cream from the bottom, while on the other is a wood strip, which, in the action of turning the dasher, presses closely against the outside of the can to allow the entire contents of the can to be thoroughly stirred. There is also provision for preventing the dasher being turned backward.

NORTH BROS. MFG. COMPANY

of Philadelphia are making Shepard's Lightning, Gem and Blizzard Freezers, in sizes from 1 to 14 quarts. This year they have adopted for their entire line the electric welded wire hoop pails, the hoops of which they claim are twice as strong as flat hoops, and are guaranteed by the company not to fall off. The cap covering the gearing on the Gem Freezer is now made separate and is bolted to the cross piece instead of being cast solid. The pails are made, it is stated, of the best Virginia white cedar. All inside parts of Freezers are thoroughly coated with pure block tin and outside parts galvanized. The point is made that materials and workmanship are of the very best, and all Freezers are completely wrapped in heavy paper to protect them from dirt and dust in transportation and while in stock.

CHARLES W. PACKER,

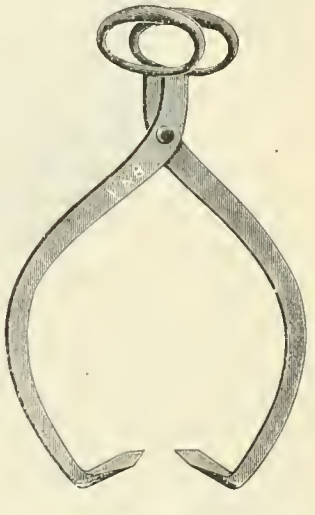
Philadelphia, is offering his Standard Freezers for families, confectioners, hotels, &c., in suitable sizes, the double action Freezers being made for hand or power. The automatic double acting vibrating scraper, which is used in all the machines, is described as adjusting itself closely to the inner surface of the can, removing the frozen cream as rapidly as formed, while the deflectors, lifters and cutters force the unfrozen portions to the sides of the can, causing continuous action upon the cream, by which the maximum amount of agitation is secured and the cream is thoroughly beaten. It is stated that the cans are made of the best quality, extra weight and heavily coated tin plate, the tubs of selected seasoned white cedar, the inside castings tinned, the outside castings galvanized, and that malleable iron fittings are used on the tubs.

V. CLAD & SONS,

Philadelphia, manufacture the Seamen Ice Cream Machine for hand and for power, with extra tub, can, beater and cover; also an extensive line of Philadelphia Ice Cream Machines for hand and for power, with and without engines, including 30 and 40 quart sizes. The cans for these Freezers are made of copper or tin. Freezers without beaters are made with wooden handle, malleable iron rims on body and cover and malleable iron bottom. The body is of DXXXX charcoal tin plate, with the rim around the top tinned. The concern also make Packing Cans, Carry Out Cans, porcelain lined Iron Cans, Cedar Tubs, extra heavy Shipping Tubs and a general line of Ice Cream Tools.

The V. & B Solid Steel Ice Tongs.

The cut herewith given shows the new ice tongs which have just been put on the market by the Vaughan & Bushnell Mfg. Company, 877 to 887 Carroll avenue, Chicago. These tongs are drop forged of solid cast steel, with no weld whatever. The handles are not only an integral part of the tongs, but they are also by this method made of a more



The V. & B. Solid Steel Ice Tongs.

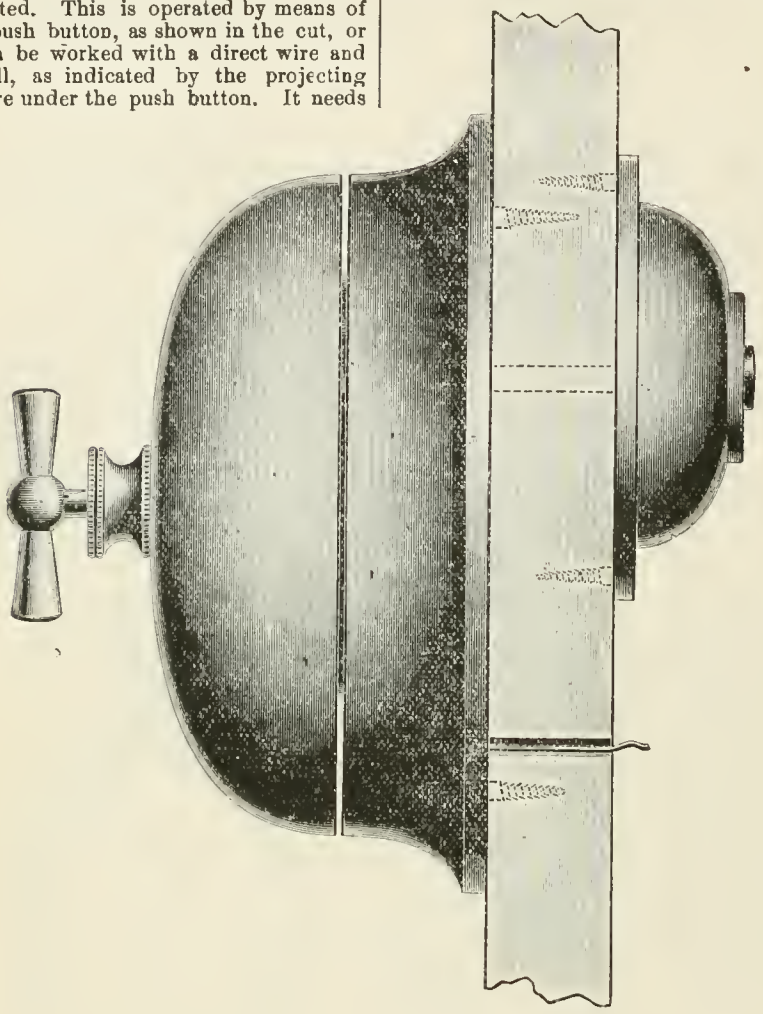
satisfactory shape. The upper portions of the rings are swelled to fit the palms of the hands and give the holder a firmer grip. These tongs are not only light but very stiff and strong. They are made in three sizes, opening 13, 17 and 24 inches.

Mangles.

S. C. Johnson, Racine, Wis., is offering mangles in three different styles, designed to take the place of sad irons for doing up linen and bedding. The smaller machine weighs 100 pounds and is suitable for use in small families. The Eclipse machines have rollers either 24 or 27 inches long; the 24-inch weighs 200 pounds, and the 27-inch 225 pounds; the machines being adapted to general use. The third style, the Domestic, is made on the same plan as these made in England, weighing 350 pounds, being especially adapted to hotel use. The manufacturer remarks that where there is any considerable quantity of linen and bedding to be ironed the mangles are quite a necessity; where there is only a small quantity they are a luxury. The point is made that the common method of using a hot sad iron does more or less scorch the fiber of the linen and turn it yellow, while linen ironed with a mangle has the appearance of always being new.

Electric Ring Door Bell.

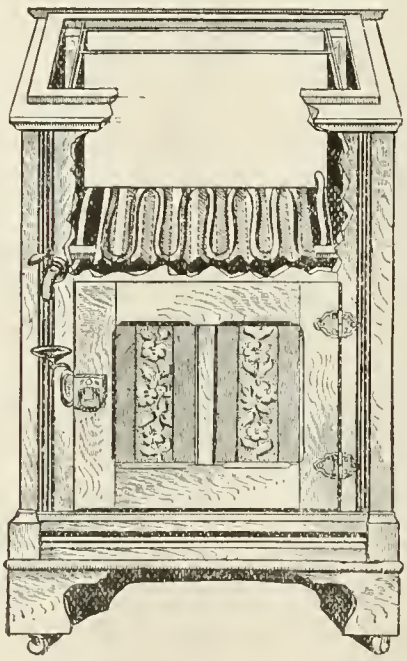
Sargent & Co., 35 Chambers street, New York, are offering a continuous electric ring door bell, as here illustrated. This is operated by means of a push button, as shown in the cut, or can be worked with a direct wire and pull, as indicated by the projecting wire under the push button. It needs occasional winding, which is done with the T-handle, seen at the left. It gives the sound of an electric bell, and will continue to ring (until run down) as long as the pressure is applied to the push button or the wire drawn by the bell pull. This is accomplished by a clock mechanism inside. The bells are packed one in a box, and finished in nickel, Yeddo bronzed and antique copper.



Continuous Electric Ring Door Bell.

National Refrigerator.

Page, Dennis & Co., 325 Broadway, New York, are introducing the National refrigerator, as here shown. They are manufactured under recent letters patent at their factories in Muskegon, Mich., shipments being made from either address. The line is an improvement on the American pattern long made by them, consisting in the arrangement and location of the porcelain lined water tank for supplying cooled water, together with the piping seen in the cut. This style has been perfected largely for domestic use where ice is expensive, as well as for exportation to warm countries. The tank is placed at the back of the ice chamber instead of at the end, giving about double the capacity, besides affording a clear way in putting in the ice. Cooled drinking water is drawn at the faucet through parallel lines of block tin pipe, which, being directly under the ice, is further refrigerated. A tight cover to the tank keeps the water from being contaminated by food odors. The corrugated ice rack slopes rearward, thus keeping the ice continually against the tank by gravitation. The side frames of the refrigerator run clear to the bottom, giving a firm support for the casters. The boxes are made in both soft and hard woods,

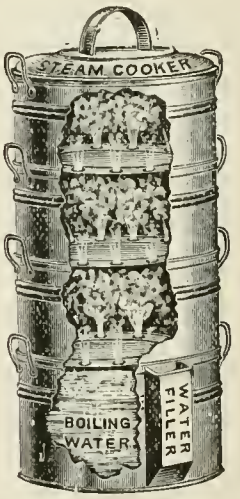


Sectional View of Water Tank and Ice Chamber of the National Refrigerator.

and for each size a mirror backboard or top is made, which, placed on the refrigerator, makes of it a sideboard. These tops are interchangeable and can be ordered at any time.

Pyramid Steam Cooker.

The cut here shown represents a steam cooker offered by Silver & Co., 304–310 Hewes street, Brooklyn, and 20 Warren street, New York. The cooker is made of IX tin, buffed bright on the outside, each cooker having one boiling and three cooking apartments. The different vessels can be used separately, as many at one time as is desired. The steam openings around the edge of each vessel are located in depressions or gutters, allowing the condensed steam to find its way back to the lower vessel along the sides rather than down the center and through other cooking foods. The manufacturers guarantee the device to cook an entire dinner of meats, vegetables, puddings, &c., at one time without attention and without imparting the flavor of one to the other; to economize nearly one-half in fuel and to be steamless and odorless and not to mingle the flavors. The steamer is made in three sizes: No. 1, vessels 8 inches in diameter, holding 2 quarts each; No. 2, vessels 9 inches in diameter, holding 3 quarts each, and No. 3, vessels 10 inches in diameter, holding 5 quarts each.



Pyramid Steam Cooker.

The National Chemical Works of Cragin, Ill., are manufacturing Bonnell's Nubian system of scale prevention in steam boilers. The Nubian scale prevention, as it is termed, is not a scale solvent, because the manufacturers claim that any article which will dissolve scale will injure the metal of the boiler. It has as its base tri basic sodium phosphate, with which are combined the proper ingredients to prevent scale formation. Its action is such as to prevent additions to the scale deposit and to cause the disintegration and dropping off of the old scale in a short time. The Nubian prevention is stated to be especially efficacious in marine boilers and others in which the cylinder oils get into the feed water. Prices and full directions for its use are given in a neat little pamphlet which has just been issued by the company.

Coal mines in Colombia are to be developed by a syndicate of American capitalists, the Colombian Government being a partner in the enterprise.

STOVE TRADE NOTES.

New England Stove Trade.

The condition of the stove trade of New England is only fairly satisfactory. The business of February was an increase over that of January and the outlook for March is regarded as more promising. At present the lines selling most freely are gasoline stoves, refrigerators and ranges. The manufacturers and jobbers are looking more and more to the furniture trade in this section, and this branch is probably handling in the neighborhood of 50 per cent. of all the stoves sold in New England. This is largely due to the growth of the installment idea, which is extending to many of the smaller towns and cities of the East. The regular stove trade for the most part refuse to do business in this way, but it seems to be a fixed thing in the furniture trade. Manufacturers of furnaces say that they find it almost impossible to induce retailers to contract for the season's supply. Heretofore, where an order for 10 to 20 furnaces to be delivered as wanted during the season has been booked, those needed for immediate requirements, with, perhaps, one for stock, are now bought and the future is left to take care of itself. This conservatism prevails in other lines as well and has a tendency to continue competition for orders indefinitely through the season.

The Baltimore Stove Trade.

There is not much activity among the manufacturers just now. Two foundries are closed for repairs and stock taking, and others are running on short time. There is a good deal of stock on hand left over from last season, and this will necessarily curtail the production for the coming season's business. The present demand for ranges and cook stoves is fair, but Western competition is very sharp on low priced goods. The season for summer goods has opened, but sales are small and there seems to be little disposition on the part of dealers to place orders early. The outlook for heating stoves for the coming season is, on the whole, very encouraging. Dealers have little or no stock on hand, as a result of careful buying during last season; and if business in general recovers itself before the fall trade sets in orders will assume fair proportions. Collections are not up to the average, but taking the existing depression into consideration, they are satisfactory; and there have been but few losses. Terms of settlement have in many cases been lost sight of completely, and much paper has been renewed for customers who have hitherto not had occasion to ask favors. There will be an increase next season in the production of furnaces, and a probable decrease in the production of the fire place heaters known as Baltimore heaters. Of late it has been found that the cheaper lines of furnaces have come into strong competition with Baltimore heaters. Building prospects in Baltimore are good, and while it is not expected that there will be a "boom," still it is anticipated that building operations will largely exceed those of other years, as the new trolley roads will render many desirable suburban building lots easy of access, and open to capitalists channels for investment. This will eventually benefit the stove and heating trades.

Comparative Cost of Operating Gas and Coal Stoves.

With the increasing use of gas as a fuel for cooking purposes no little discussion has ensued with regard to the cost of operating a stove burning gas as compared with one employing coal. In order to demonstrate what each could do under practically the same conditions, tests were recently made and a table of the results prepared under the direction of the United Gas Improvement Company of Philadelphia. The figures show a comparison between the cost of operating a gas and coal range, cooking three regular meals per day. Below we present the table as it appeared in a recent issue of the *Progressive Age:*

Gas Range.

	Dinner.	Lunch.	Breakfast.
Meat	Roast beef, 5 pounds 7½ ounces.	Mutton chops, 2 pounds 3½ ounces	Beefsteak, 1 pound 8 ounces.
Potatoes	Browned, 1 pound 4 ounces.	French fried, 1 pound 4⅝ ounces	French fried, 1 pound 5½ ounces.
Biscuit	2 pounds 3 ounces.	2 pounds 5½ ounces	2 pounds 4 ounces.
Tomatoes	1 quart stewed.		
Corn	¾ quart stewed		
Peach pie	Baked, 1 quart peaches		
Coffee—Tea	1 quart.	1 quart.	3 pints.
Water for washing dishes	10 pounds.	10 pounds.	10 pounds.
Total time	1 hour 30 minutes.	40 minutes 30 seconds.	46 minutes.
Total gas used	31 34 cubic feet.	16.16 cubic feet.	20.38 cubic feet.

Coal Range.

	Dinner.	Lunch.	Breakfast.
Meat	Roast beef, 4 pounds 13½ ounces.	Beefsteak, 2 pounds 10 ounces.	Mutton chops, 3 pounds 4 ounces.
Potatoes	Browned, 1 pound 5 ounces.	French fried, 1 pound 5 ounces.	French fried, 1 pound 6 ounces.
Biscuit	2 pounds 9 ounces.	2 pounds 8 ounces.	2 pounds 12 ounces.
Tomatoes	1 quart stewed		
Corn	¾ quart stewed.		
Peach pie	Baked, 1 quart peaches.		
Coffee—Tea	1 quart	1 quart.	1 quart.
Water for washing dishes	10 pounds.	10 pounds.	10 pounds.
Total time	1 hour 37 minutes	1 hour 16 minutes.	1 hour 5 minutes.
Solid fuel	¾ bundle wood, 12 pounds coal.	¼ bundle wood 6.68 pounds coal.	1 bundle kindling, 12 pounds coal.

Gas Range.—Biscuits were evenly browned without being moved; average time in oven, 13.8 minutes.

Weights of potatoes and biscuits were taken after being cooked.

Roast nicely cooked but quite rare in the center.

First weight of roast	5.445 pounds.
Second weight of roast and drippings	4.758 pounds.
Loss = 12.6 per cent. =	0 687 pounds.
Total gas per day =	67.88 cubic feet.
Cost per day at $1.25 per 1000 =	8.483 cents.
Difference between cost of coal and gas =	4.721 cents.

Coal Range.—Biscuits were not well browned on the bottoms; average time in oven, 8.8 minutes.

Weights of potatoes and biscuits were taken after being cooked.

Roast was overdone on the outside and too rare in center.

First weight of roast	4.85 pounds.
Second weight of roast and drippings	3.86 pounds.
Loss = 20.4 per cent. =	0.99 pound.
Coal used per day =	30.68 pounds.
Two bundles kindling at 2 cents =	4.000 cents.
Cost coal at $6 (anthracite) =	9.204 cents.
Total	13.204 cents.

Coal cost 55.6 per cent. more than gas.

The Chicago Stove Trade.

Whatever diferences of opinion may exist among the managers of the Chicago stove houses on most subjects, substantial unanimity prevails with regard to the condition of business at present. It is exceedingly quiet. January and February fell considerably below the corresponding months of last year in volume of business, and March does not show much improvement. The month is young, it is true, and the advent of

spring weather may tone up the stove trade just as it favorably affects other branches of business, but if it does the trade will be agreeably surprised. Travelers are out soliciting business, but they are mainly introducing new cook stoves and ranges, with a view to getting their special points well understaod by dealers, as an essential preliminary to the fall campaign. In this respect some houses may be said to be quietly accomplishing much good, as they have not permitted hard times and dull trade to blunt their enterprise, but are offering new and improved patterns with as much confidence in a large trade later on as they have displayed in previous seasons.

Generally speaking, the volume of business in the early spring months is not expected to attain any considerable proportions, so far as coal and wood goods are concerned. In fact, some managers assert that if they were to withdraw from the field entirely during these months their year's business would hardly suffer, except so far as laying plans for the fall and making arrangements for the heavy business of that season might be interfered with. The vapor, oil and gas stove manufacturers are to a great extent responsible for this. Every year they seem to be making more headway in the spring and summer trade. Their business is now of large proportions. They are notifying their agents now that if they desire prompt shipments their orders must be sent in a sufficient time in advance to give some leeway. This is particularly true of vapor stoves, which have latterly been concentrated in fewer hands.

As might be expected, the hard times and the consequent necessity for economy have greatly increased the demand for stove repairs. The cogent statement is made that coffins and stoves are the last things to be bought. Every effort is made to postpone the purchase of a new stove. All sorts of odd castings are now being called for, some of which have not been in demand for years. This shows that parts of stoves are being renewed which in good times would cause owners to discard the stoves and buy new ones rather than go to the considerable expense entailed in taking their stoves apart and reconstructing them. It makes no difference whether the stove is 10 or 30 years old, the manufacturer is expected to supply the part desired, and is severely censured if he cannot furnish it on the day it is called for. Much annoyance and vexation of spirit are caused these days by almost unreasonable requests for repairs to very old patterns, and the manufacturers are strongly tempted to adopt a rule that no repairs will be furnished for stoves more than ten years old.

Strong hopes are entertained of a good year's business in 1894. The gradual resumption of work by manufacturing establishments, the prospects of considerable activity in the building trades, and above all the belief that the very worst of the great business depression is over, are good grounds for hope in the future. Even the low prices now ruling for farm produce must show an improvement ere long in the nature of things, and if farmers are again prosperous there will be no element lacking that is really necessary to sustain trade.

Cupola Management.*—VI.

BY DR. EDWARD KIRK.

Charging.

The old way and the way still in vogue in some localities of stocking, loading or putting the fuel and iron into a cupola is to place a sufficient quantity of fuel in a cupola to fill it above the tuyeres. On this fuel or bed is placed from 50 to 500 pounds of iron, according to the size of the cupola, then from one to four shovels of fuel are put in and from 50 to 200 pounds of iron, and so on until all the iron to be melted is placed in the cupola.

This way of stocking a cupola mixes the fuel and iron in the cupola and they come down to the melting point together. The fuel fills a space that should be filled with iron, and a great deal of the melting surface of the cupola is lost, and the cupola's melting capacity reduced in proportion.

The modern way of stocking a cupola is to put in the fuel and iron in layers or charges. Each layer or charge of fuel is separated from the layer or charge above and below it by a layer or charge of iron, and each layer of iron is separated by a layer of fuel. This way of stocking a cupola is known as charging the cupola. When a cupola is charged in this way the iron comes down to the melting point in a body extending over the melting surface of the cupola, and the entire melting surface is utilized. The melting capacity of a cupola is about one-half greater when charged in this way than when the fuel and iron are mixed and the consumption of fuel is also less.

The first charge of iron is placed on the bed at the melting point. In melting this charge of iron a certain amount of fuel is consumed and the top of the bed settles down from the top of the melting zone to the bottom of the melting zone. The charge of fuel on top of the charge of iron that has just been melted settles with the iron until it unites with the bed and places the top of the bed again at the top of the melting zone, ready to melt the next charge of iron, and so on with each succeeding charge of fuel and iron through the heat. This is the correct theory of melting iron in a cupola, and the practice that must be followed to obtain the best results from a cupola.

Now, having described the theory of charging and melting, let us consider the practical working of a cupola upon the theory. The amount of iron placed upon the bed in the first charge and in each charge through the heat must be the exact amount of iron the fuel will melt while settling from the melting point to the bottom of the melting zone. The amount of fuel in each charge must be the exact amount required to raise the bed from the bottom of the melting zone to the melting point. If the charges of iron are made too heavy the iron comes dull at the latter end of the charge and hot at the first of the charge until a few charges have been melted, then it comes dull all through to the end of the heat. When the charges of iron are too light the iron comes hot, but there is a stoppage in melting at the end of each charge, changing to continuous but very slow melting as the heat progresses.

When the charges of fuel are too heavy the iron melts slow and uneven, and if the heat is a long one it comes dull and is hardened in melting. When the charges of fuel are too light and the charges of iron heavy the result is dull iron. When the charges of fuel and iron are both too light the iron generally comes hot but slow through the heat, and the full melting capacity of the cupola cannot be realized.

There is no rule for making the weight of the first charge of iron of any definite proportion to the weight of the bed of either anthracite coal or coke that holds good in all cupolas. Manufacturers of some of the patent cupolas have such a rule for their cupolas that is approximately correct, but the tuyeres in different sizes of these cupolas are always placed at the same hight and about the same amount of fuel is required for a bed. The bed will melt a heavier charge of iron in settling than the other charges of fuel and the first charge is generally made from one-third to one-half heavier than the subsequent charges. The weight of the first charge of iron varies from two and one-half to four and one-half times the weight of the bed with anthracite coal; with coke the weight of the first charge varies from one and one-half to four and one half times the weight of the bed.

These wide variations in the weight of the first charge of iron in proportion to the weight of the bed are largely due to the difference in the hight of tuyeres and the large amount of fuel required for a bed in a cupola with very high tuyeres. But variation is also due in many cases to bad judgment in estimating the weight the first charge should be. The greater the weight of the first charge in proportion to the weight of the bed, the better the average will be in melting, and careful experiments should be made with every cupola to learn the largest amount of iron it will melt on the bed with safety, and that amount should always be placed in the first charge.

There is no rule for making the weight of the charges of fuel or iron of any definite proportion to the weight of the bed or first charge of iron, and the weight of the charges of both fuel and iron are frequently changed in different parts of the heat, to give a hotter iron for some special work or to make the iron run of an even temperature through the heat. In practice, the weight of the charges of iron to the charges of anthracite coal varies from 6 to 14 pounds of iron to the pound of coal. With coke they vary from 6 to 15 pounds of iron to the pound of coke. These variations in the per cent. of iron to fuel are due in many cases to the quality of fuel and in many other cases to poor judgment in working the cupola. In all cases the charge of iron should be made as heavy as the charge of fuel will melt and produce good hot iron for the work, for this is the only way a good per cent. of iron to the pound of fuel can be obtained.

Placing the Charges.

The top of the bed is made as level as it can be before charging the iron, and the smoke must all have disap-

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peared so the melter can see how to place the charges. When the cupola is very high a few hundred of stove plate or other light scrap is placed upon the bed to prevent the heavy pieces of pig or other iron breaking up the fuel and settling down into the bed when thrown in. The pig should be broken into short pieces and placed in the cupola with the end toward the lining. The pieces of pig or other iron are placed close together so as to utilize all the heat and prevent its escape up the stack, and each charge is made as level as it can be on top. The gates and cupola scrap are placed on top of the pig and are used to fill up holes and level up the charge. Old scrap is generally charged with the pig when heavy, and on top of the gates when light. Rattle barrel iron and gangway scrap or riddlings goes in with the gates a few shovels to each charge.

The charge of fuel is distributed evenly over the charge of iron, and the second charge of iron is put in the same as the first, and the second charge of fuel the same as the first, and so on until the cupola is filled to the charging door. Charging is then stopped and the door closed until the blast goes on. When melting begins the stock begins to settle, and the door is opened and charging continued as before until all the iron to be melted is placed in the cupola. While charging is going on the cupola is kept filled to the charging door to prevent the gas igniting and making a hot flame at the charging door, which makes it hot for the men and difficult to place the charges of fuel and iron properly. When charging is finished the charging door is closed to prevent sparks or pieces of burning fuel being thrown upon the scaffold.

When the iron is all or nearly all melted that has been charged, and it is discovered there is not sufficient iron in the cupola to pour off the work, more iron is sometimes charged. At this stage of the heat the stock is so low in the cupola and the heat is so intense that the cupola is in a very bad condition for resuming charging to melt more iron. It is only a waste of fuel to charge it into the cupola at this stage of the heat, and the only iron that can be melted on the fuel already in the cupola is the light scrap, and but a limited quantity of it. When the charging door is opened the heat at the opening is so intense that the men cannot go near it, and the scrap must be thrown in from a distance or by standing alongside of the cupola out of the heat and throwing the iron around into the door on a shovel.

Poor melting may be due to bad charging. Iron or fuel should never be dumped into a cupola from a barrow, for it all falls on one side of the cupola The iron generally lays where it falls in a pile, and the fuel rolls to the other side of the cupola, and good melting cannot be done with the fuel on one side and the iron on the other. This way of charging is about equal to the old way of mixing the fuel and iron, and only about one-half of the melting capacity of the cupola can be realized. Fuel should never be emptied into a cupola from a basket or box, for it all falls in one place and cannot be spread evenly over the charge of iron. To charge a cupola properly the iron must all be thrown in with the hands and the fuel with a shovel or fork.

Charging Flux.

When it is desired to tap slag the slag producing material or flux is charged in the cupola on top of the iron and evenly distributed. The flux is sometimes put on each charge of iron, but generally about one-sixth of the heat is charged without flux. After that, flux is put in on every charge of iron except the last one or two charges, where it is not required if the proper amount has been used through the heat. The quantity of flux required depends upon the slag producing propensity of the material used and the condition of the iron charged, and is from 30 to 100 pounds to the ton of iron melted. If the iron to be melted is all clean iron the amount of flux required is less than when the iron is dirty scrap or a large per cent. of the heat is sprues and gates that have not been milled and are melted with a heavy coating of sand on.

If it is not desired to tap slag and the flux is used only to make a brittle slag in the cupola, it is charged in small quantities of from 5 to 10 pounds to the ton of iron, and is placed around the outside of the charge near the lining. Flux is sometimes charged in a cupola in a sufficient quantity to produce a large body of slag through which to filter the molten iron and cleanse it of impurities, but not in a sufficient quantity to admit of slag being drawn from the cupola. This way of fluxing works very well in a short heat, but in a long heat the slag sometimes absorbs a large amount of impurities, becomes overheated and boils up in the cupola and fills the tuyeres, and when boiling the slag cannot be drawn from the cupola at the slag hole and the bottom generally has to be dropped.

ODD PLATES.

Henry N. Clark, 103 and 105 Blackstone street, Boston, is pushing the North Star Refrigerator and Central Oil-gas Company's full line in the New England States.

The Ridgway Furnace Company of 76 Union street, Boston, Mass., are offering the Ridgway revolving open fire pot furnace in substantially the same form as last season. The furnace was shown at the 1892 exhibition of the Massachusetts Charitable Mechanics' Association and was given the only gold medal awarded furnaces alone in 35 years.

One of the largest retail stores in the Northwest is known as the Rialto, recently built in the city of Seattle, Wash., this structure having a frontage of 240 feet and a depth of 110 feet. The proprietors of this establishment are agents for the goods made by the Peninsular Stove Company of Detroit, Mich., and have started out under most flattering prospects.

At the annual meeting of the Foster Stove Company, recently held at Ironton, Ohio, Charles Alexander was elected a director in place of his father, lately deceased. Mr. Alexander was also appointed foreman of the works.

The William Miller Range & Furnace Company of 9 and 11 West Fifth street, Cincinnati, Ohio, favor us with a copy of a catalogue of 12 pages, relating to a new line of wrought steel ranges which they are putting on the market this season. The line is made under the name "Vigilant," and has been brought out to meet a growing demand for a "well made, well finished, substantial and economical range, which would be a first-class roaster and baker, and could at the same time be sold at a price that would bring it within the reach of any one who might be in want of a first-class cooking apparatus." The Vigilant is intended for burning soft coal or hard coal or wood, and embodies among its features of construction drop oven and feed door with warming oven underneath, patent double centers, improved reversible duplex grate, regulating damper, gravity latch, sliding braces for supporting the oven door and asbestos lined flues. The range is shown in a number of varieties in the pamphlet at hand, one style being intended for burning wood only and made with extended fire box. The last page of the pamphlet is devoted to the Puritan range, which is a member of the same general class as the Vigilant, but is made in two sizes only.

The William Miller Range & Furnace Company of Cincinnati, Ohio, have just secured a large contract for heating apparatus for a private residence. The equipment calls for Miller-Monitor steel warm air furnaces sufficient to heat a $50,000 residence now in course of erection at Lafayette, Ind. We understand that the contract was secured against very severe competition.

In the death of George H. Pickering, which occurred a short time ago, the stove trade has lost a well-known member, and a veteran traveler. For some 21 years he represented the Spicer Stove Company of Providence, R. I., and during a period of nearly 11 years visited the trade in Eastern Massachusetts, Connecticut, Rhode Island and Long Island. He was a favorite with all who knew him and his sudden death after a week's illness was a shock to his host of friends. He was 45 years of age and a member of the Grand Army of the Republic.

We have received from the Excelsior Mfg. Company, St. Louis, Mo., a large pamphlet of several pages, which is designated by the company as "The Missing Link." In explanation it is stated that the missing link between the seller and buyer is already well known, and that it is not necessary to go to the wilds of Africa to find it. "There is nothing like it to bring the seller and the buyer into the right relationship and the magic word representing so much is 'Advertising.'" This is the keynote of the pamphlet, the pages of which are devoted to cuts suitable for use in connection with advertising matter by the dealer handling Charter Oak stoves and ranges.

The Rapid Transit Stove & Furnace Company, successors to J. B. Oldershaw of 628 North Eutaw street, Baltimore, Md., are looking for premises adapted to the requirements of a stove foundry. They propose, as soon as located, to commence the manufacture of Rapid Transit, Grand Rapid and Resplendent fire place heaters, Rapid Transit stoves and double heaters, Rapid Transit hot air furnaces, Diffusive heating stoves, ventilating register frames and chimney caps under the patents held by J. B. Oldershaw. The goods are all specialties and have a good local reputation. The company will locate in Baltimore, Philadelphia or some other point where good manufacturing and shipping facilities may be obtained.

The B. C. Bibb Stove Company of Baltimore, Md., have closed their works for stock taking and repairs. They will commence running again in a few days. They expect to have some additions to their well-known line of goods in readiness for the opening of the coming season.

THE PENINSULAR STOVE COMPANY of Detroit, Mich., send us a circular illustrating a plain finish wrought steel range, which they have just placed upon the market. They state it is neither cheaply made nor inferior in any way, but well built and substantial. It has draw out grate and asbestos lined flues, together with other features which, judging from the extensive sample orders received by the company, are making it popular wherever introduced.

A LARGE COLORED CARD is sent through the mail by Eugene Munsell & Co. of 218 Water street, New York, which measures 6¾ x 9¼ inches, and bears upon one side an announcement relative to the Manhattan stoves, ranges and furnaces made by the concern named, as well as an indication that they are also headquarters for mica. Below the announcement are blank lines for the name and address of the person to whom the card is sent. On the other side, at the left, is contained a picture of a steam whistle, and the statement that it is unnecessary for one of these devices to be in full blast all the time in order to make its presence known. Neither is it necessary that the person whose name is signed to the card should indicate his intended visit to the trade on or about blank date by noisy statements oft repeated. The announcement is signed by Charles E. Coleman, representing Eugene Munsell & Co.

Adjustable Motor Thermostat.

We show in the accompanying illustrations a plan view and elevations of the adjustable motor thermostat made by E. Barney, Schenectady, N. Y. The device consists of a sensitive blade mounted upon a japanned metal plate upon which are fastened brass contact

Adjustable Motor Thermostat.—Fig. 1.—Sensitive Blade.

posts and binding connecting posts properly equipped for motor connections. The sensitive combination blade, Fig. 1, is supported upright by a brass post, as shown in Fig. 2, which is an elevation of the device. The brass post

Fig. 2.—Elevation of Thermostat.

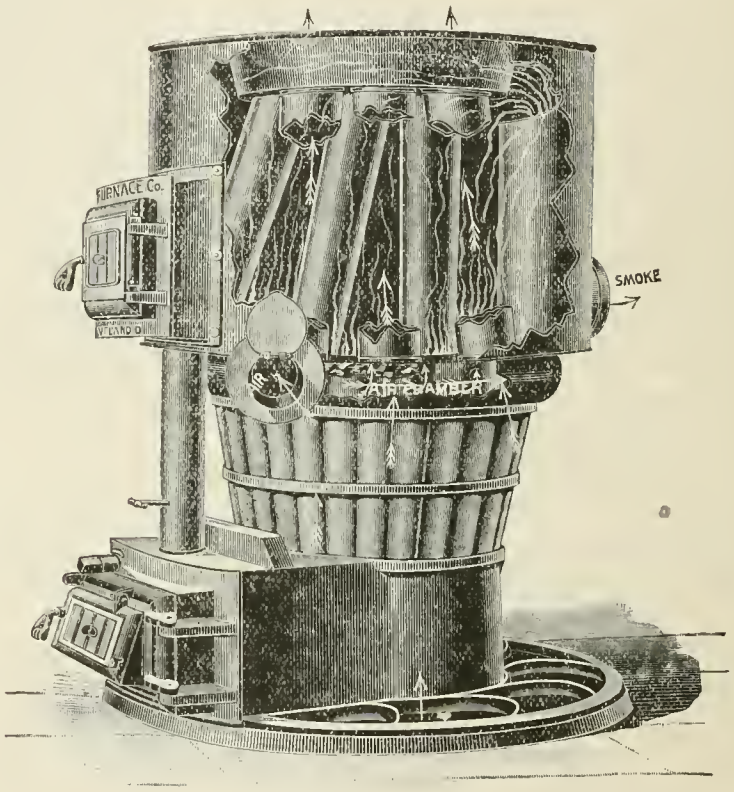
at the end of the blade fits in a socket and is held by a set screw, as shown. This arrangement permits the operator to adjust the blade to the right or left at will and securely fasten it in the proper position. Fig. 3 is a plan view

Fig. 3.—Plan of Thermostat without Blade.

of the device without the blade. At the front end, as shown, are two stationary contact posts, each having a working screw through it and between the points of which the front end of the thermostat blade works. For heat the blade moves to the right, for cold to the left. At the rear of the thermostat plate are three binding posts connecting the thermostat with the battery and motor. When the contact point of the thermostat blade moves to the right or left it touches the point of the screw, closing the circuit, which releases the motor that works the damper. The screws passing through the contact posts being adjustable, may be set to any degree of heat required.

The Fox Soft Coal Furnace.

The Fox Furnace Company of 28 Vincent street, Cleveland, Ohio, are offering the trade a heater for using soft coal and which represents the results of many years' experience with this kind of fuel. The manufacturers state that by means of a gas ring, which is placed between the upper section and the radiator of the furnace, an air chamber is formed which leads to the outside of the casing. Through this connection a current of air is taken and passed over the heated surfaces of the furnace, being raised in its progress to a high temperature. It is then introduced through openings into and above the fuel while in process of combustion, giving "a supply of heated oxygen which, combining with the gases of the coal, cokes the coal and consumes the gases of which the smoke and smudge consist." The makers claim that by this means soft coal can be burned with entire success and with but little smoke or soot beyond that of hard coal. The furnace is provided with the Smyth triangular bar grate, well known to the trade; the fire pot is made in two sections, each of which is heavily corrugated, while the radiator is made of steel plate, provided with a series of heavy cast iron ducts or tubes running from the outside at the bottom to the center at the top, passing the air to be heated directly over the center of the fire pot, thus warming it with great rapidity. All parts of the radiator, including the air tubes, are protected by a constant current of air which, in proportion to the size of the fire, passes over them with greater or less rapidity. The dampers are so constructed that by means of a nickel plated regulator they can be opened and closed from the upper floors. The casings are made double, with an air space, allowing for circulation between them, and thus reducing the radiation into the cellar to a minimum. The illustration which we present herewith shows the Fox soft coal furnace with the outer casing removed, clearly indicating the internal arrangement. The heater is made in



The Fox Soft Coal Furnace with Outer Casing Removed.

five sizes and is especially adapted for use in low cellars.

The White Star Steamship Company, in a letter to the New York Dock Board requesting increased pier accomdations, announce that they are contemplating the construction of a ship whose length will be about 640 feet, but it will be impossible for them to proceed with the plans of this vessel until they are assured of obtaining adequate pier space. This company, says the New York *Marine Journal*, handled last year some 900,000 tons of cargo and over 100,000 of coal, their wharf expenses, labor, &c., amounting to nearly $500,000.

The climax of unreasonableness in the way of strikes seems to have been reached recently at Providence, R. I., where 300 unemployed and needy men were given work at $1 a day by the Commissioner of Public Works. On finding that they were required to work for ten hours a day the whole gang struck rather than work over nine hours.

TRADE REPORT.

The Iron Market.

The monthly statistics of Pig Iron, published in *The Iron Age*, show that February recorded an increase of close to 11,000 tons in the weekly capacity, and it is well known that west of the Alleghanies and north of the Ohio further additions to the number of active plants have been made since March 1, and that more are coming.

So far as is known no contracts have yet been made for non-Bessemer Lake Ores, so that the capacity of the furnaces in the Central West making Foundry and Forge grades to pound the markets of the country cannot yet be gauged. It is, sure however, that considerable displacement will take place.

With Steel Billets back to $15.25, Pittsburgh, and at correspondingly low prices in the East, and with Finished Iron and Steel at the lowest prices, the near future does not look rosy. Some encouraging talk is indulged in, but no facts are brought forth to convince those who would be only too glad to accept brighter views.

Pig Iron.—Current business in the New York market is light, and no large contracts have been recently placed. An interesting fact is that Carrie, a Pittsburgh Iron which was quite well known in this market in past years, is again being offered. On the basis of Pittsburgh open quotations for Foundry Iron competition from that source in this market would be out of the question. No Pipe contracts of any consequence have been placed, except one lot of 600 tons for Warren, Pa. We understand that the East River Gas Company propose to lay a very large mileage of Cast Iron Pipe in this city this year. The company will order the Pipe in small quantities as required unless some satisfactory arrangement of a general contract with quick delivery on specifications for sizes is made. We quote standard brands $13 @ $13.50 for No. 1; $12 @ $12.50 for No. 2, at tidewater. Southern Iron, same delivery, $12.75 @ $13.25 for No. 1; $11.25 @ $11.75 for No. 2; $11 @ $11.25 for No. 3; $11.25 @ $11.75 for No. 2 Soft, and $11.75 @ $12 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10 50 @ $11.

According to our Philadelphia report, sales in that market have been on about the usual scale, no larger, no smaller, but fairly in line with the offerings. The feeling is not strong by any means, and with prices ruling as they now are at the lowest ever recorded, consumers seem satisfied to cover their requirements by purchases of small lots, rather than by contracting for three or six months in advance. Consumers are determined to be on the safe side, and to that must be attributed their policy of extreme conservatism. At the same time it is obvious that consumption is not increasing to any very great extent, otherwise there would be more scarcity of Iron as well as firmer prices. Prices have shown very little change, although of late, under reports of cheaper Ores, there is less firmness than there was some time ago. Sales are chiefly in small lots, and for Philadelphia delivery at prices within the limits named below, viz.:

No. 1 Foundry	$13.00 @	$13.50
No. 2 Foundry	12.25 @	12.75

The week was a quiet one in the Chicago market in all classes of Pig Iron, with very few sales reported of over 100 tons. Inquiries for local Coke Iron are of a character indicating considerably better business in the near future. Quotations are given as follows, for cash:

Lake Superior Charcoal	$15.00 @	$15.25
Local Coke Foundry, No. 1	12.00 @	12.50
Local Coke Foundry, No. 2	11.50 @	12.00
Local Coke Foundry, No. 3	11.00 @	11.50
Local Scotch	13.00 @	13.50
Ohio Strong Softeners No. 1	13.50 @	14.50
Southern Silvery, No. 1	@	12.50
Southern Silvery, No. 2	@	11.75
Southern Coke, No. 2	11.25 @	11.50
Southern Coke, No. 3	10.75 @	11.00
Southern, No. 1, Soft	11.25 @	11.50
Southern, No. 2, Soft	10.75 @	11.00
Tennessee Charcoal, No. 1	15.50 @	16.00
Tennessee Charcoal, No. 2	15 00 @	15.25
Alabama Car Wheel	18.50 @	18.65
Jackson County Silvery	15.00 @	16.00
Other Ohio Silvery	13.00 @	13.50

The Pittsburgh market does not show any gains in volume of business, while prices continue weak and are a shade lower. It is evident that buyers have figured out a lower cost of production since the transactions in Ore took place, and are content to put off purchases until the last moment in the belief that by waiting they will be able to do better. On the other hand, Pig Iron makers claim that taking Ore, Coke, Limestone and labor at ruling prices, they cannot make Iron and realize a profit even at present prices. The tone of the market is weak, and good sized orders placed at this time would probably shade our lower quotations. We quote as follows:

No. 1 Foundry	$11.75 @	$12.00, cash
No. 2 Foundry	10.75 @	11.00 "

There has been no increase in the volume of business in Pig Iron during the week in Southern markets. There is a steady demand from the jobbing foundries in certain district, but the orders seldom reach 300 tons in any one lot, and are more frequently for single carloads, and yet in the aggregate they compare favorably with either of the several preceding weeks. The orders from the East have not been large and have been freely met. The tone of the market continues weak, and buyers with the cash in hand could doubtless buy Iron as low as it has ever been sold. There is some inquiry for Charcoal Iron at the close, but mainly at lower prices than sellers are willing to accept. Iron Pipe works are still melting more Iron than most other interests, but not as much as they have been for some time. The indications are that stocks of Southern Iron have increased during the past month, although not to any very large extent. There has been no quotable change in prices during the week, but it is evidently easy to buy at the low quotations current. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$11.00 @	$11.25
Southern Coke, No. 2	10.00 @	10.25
Southern Coke, No. 3	9.50 @	9.75
Ohio Soft Stone Coal, No. 1	14.50 @	15.50
Ohio Soft Stone Coal, No. 2	14.25 @	14.50
Lake Superior Coke, No. 1	13.00 @	13.50
Lake Superior Coke, No. 2	12.00 @	12.25
Hanging Rock Charcoal, No. 1	17.00 @	17.50
Hanging Rock Charcoal, No. 2	16.50 @	17.00
Tennessee Charcoal, No. 1	13.50 @	14.00
Tennessee Charcoal, No. 2	12.50 @	13.00
Standard Southern Car Wheel	16.75 @	17.75
Lake Superior Car Wheel and Malleable	16.50 @	17.00

Metal Market.

Pig Tin.—Straits Tin for prompt and near future delivery, in lots of 5 tons, has been sold and openly offered at 18.50¢ ℔ lb. Rumor has it that April delivery was sold at 18.25¢. Official records show that there were, at the least, offers to sell the latter at the price quoted early in the present week. The conditions leading to this result were practically the same that have depressed the market for some time past, namely, heavy accumulation of stock in Europe; liberal shipments thence to this quarter (most of which remains in bonded warehouse pending Tariff legislation); free selling to consumers by more jobbers than one at prices closely in line with actual cost from day to day, and, last but not least, the decline that took place o about £1. 10/ ℔ ton in London price during the latter part of last and the beginning of the present week. A reaction in the London market, which, on Wednesday, caused an advance of about £1 ℔ ton, served to again harden prices somewhat in the local market, making spot purchases under 18.60¢ harder to negotiate. Purely speculative business has been conspicuous by its absence in this quarter, yet the market shows a better tone at the present writing. The consumptive demand is on a more liberal scale than it has been for some weeks, and, although

hardly up to the average for the season, yet it is remarkably good considering the conditions of general trade. Jobbers' prices for small lots remain unchanged at 20½¢ @ 21¢ ℔ lb.

Copper.—Business has not improved in this quarter and there is nothing in the way of negotiations that would indicate broader interest on the part of consumers, although reports come from reliable quarters that manufacturers of various lines of Copper and Brass goods are enjoying a better trade at present than they have for some time past. Sellers, or at least some of the producers' representatives, are offering in a very indifferent way, some refusing orders that call for deliveries prior to the opening of navigation. Enough supply comes out from one source or other to meet the demand and prices are quite as soft at the present time as they were a week ago. Lake Superior Ingot has been sold at 9⅝¢ @ 9¾¢, according to brand and size of lot. Electrolytic keeps about ¼¢ less and on ordinary casting stock 9¢ @ 9¼¢ is the range. For smaller quantities from store an advance of about 1¢ ℔ lb is usually the rule.

Sheet Copper.—A somewhat better demand is noted for Cornice Copper, although orders are still of a conservative character, and apparently for little beyond the supply of actual needs. It is believed, however, that with the near approach of spring and the resumption of building operations on even a limited scale a more active movement is imminent, for stocks of material are known to be very light everywhere.

Pig Lead.—Prices have advanced a trifle and the market has gained somewhat in tone. The turn, however, does not appear to be due to any great revival in the demand in this quarter, although a few speculators have bid stifly on forward deliveries. Restricted offering is the main basis of the strength of the market. In other words, there is no pressure of stock upon the market at the present time. Hence single carloads brought 3 30¢, while bids were made of 3 25¢ @ 3 27½¢, for prompt and near future delivery, without leading to business. Consumers appear to evince but little interest in Pig Lead so far, notwithstanding its cheapness, for jobbers describe the demand as exceedingly tame. Prices for small lots are quoted at 3⅞¢ @ 4¢, with a tendency to softness at that.

Pipe and Sheet Lead.—No appreciable improvement is reported in the demand for manufactured Lead. Business remains flat, and orders and inquiries far below the average for the present season. The depression in the building trades, which is likely to continue until a revival in general trade conditions, will, it is thought, prevent any material improvement in the near future. Manufacturers meanwhile are not inclined to press their goods on the market, in view of current low prices.

Spelter.—Except of moderate quantities there have been very few sales here and the general demand is slow despite more or less "bullish" accounts received from Western points. There is complete absence of speculation or anything bordering upon it. Prices stand at 3 85¢ @ 3.95¢ for ordinary Western brands, according to time of delivery and size of order, with an advance of about ⅛¢ for small lots.

Sheet Zinc.—The consumptive demand is entirely commonplace. During the week a further reduction in manufacturers' price amounting to 3 % has caused a corresponding drop in jobbers' prices for Sheet Zinc. For 600-lb casks 4¼¢ ℔ lb is quoted, with an addition of ½¢ ℔ lb for lesser quantities from store.

Antimony.—Of jobbing parcels sales are fair, but otherwise there is little doing. Prices for small lots remain steady at about 10¢ @ 10¼¢ for Hallett's and 10½¢ @ 10¾¢ for Cookson's.

Nickel.—The market is steady, with prices ranging between 45¢ and 55¢, as to size of lot and terms.

Tin Plates.—Little change, if any, has taken place in the character of business so far as regards transactions of any size. Future business is almost entirely neglected, the larger purchasers holding off until they can see more clearly the trend of tariff legislation. Those can makers who have not already placed their orders appear disinclined to contract for future deliveries at present, while holders of stock are not anxious to push business under the present conditions of uncertainty and low prices. The market, in a word, is a waiting one. Stocks in the hands of importers and jobbers are said to be lower than they have been for many years past. Shipments from Europe for the past seven months have been very much below the average, and of the consignments received by importers it is calculated that about 60 % are held in bond pending the fate of the Wilson bill. Never has it been more difficult to secure the filling of assorted orders. To illustrate this condition, one of the heaviest importers mentioned a day or two ago that a large customer from the country had been to him with an order for seven different descriptions of Tin Plates which were urgently required. Of these, the merchant could furnish but two, and after scouring the whole circle of the trade in New York the customer was only able to obtain one of the remaining five varieties of Plates. The demand from the smaller consumers is merely of a routine nature; yet, although individual orders are generally of small proportions, they seem to be more frequently repeated, and in the aggregate show an advance over the volume of business of last month. While not heavy, however, they have sufficient weight to keep prices down to the level at which they have been for some time past.

A London cable dispatch to *The Iron Age* of March 7 reports that the London Tin Plate market has remained quiet. Buyers and sellers are awaiting developments regarding tariff legislation in the United States. Some business has been done in Oil sizes at 3½ pence below late prices, but makers are now reluctant sellers at same figures. Liverpool prices are quoted as follows:

IC Charcoal, Alloway grade	12/3 @ 12/9
IC Bessemer Steel, Coke finish	10/6 @ 11/
IC Siemens " " "	11/ @ 11/3
IC Coke, B. V. grade, 14 x 20	Nomioal.
Charcoal Terne, Dean grade	10/3 @ 10/9

Sheet Iron.—Although the leading Sheet mills are reported to be quite busy, with plenty of orders on their books, yet jobbers with one consent declare the demand for Sheet Iron to be exceedingly light, with no improvement in sight. This may probably be explained by the fact that the mills are in many instances working on heavy orders for forward deliveries placed by the larger consumers, while others have established connections with the smaller trade, whose patronage is usually given exclusively to jobbers. This is known to be the case with several Western manufacturers whose agents have been actively canvassing in Eastern districts, where the inducement of extraordinarily low prices has prevailed to secure orders. Black Iron generally is, however, moving but slowly, and prices on this material are much that purchasers choose to make them. Makers of Galvanized Sheets are not quite so anxious, it is said, to take orders for future delivery at the current rates. The advance in price of Spelter induces the hope of higher prices on Galvanized Iron in the near future. For the present, nevertheless, there is no indication of such advance, and the prices for spot material are, if anything, inclined to weakness.

We are advised that the statement that Kirkpatrick & Co., Limited, of Pittsburgh, proprietors of the Leechburg Iron Works, at Leechburg, Pa., manufacturers of fine Sheet Iron and Sheet Steel, would engage in the manufacture of Russia Patent Planished Sheet Iron, is without foundation. What gave rise to the report is the fact that within a short time Joshua S. Ingalls & Co. of Troy, Ohio, manufacturers of Craig Steel, will move their plant to Leechburg, adjacent to the plant of Kirkpatrick & Co., Limited. This removal will not necessitate any additions or extensions to the present plant of Kirkpatrick & Co., Limited, as that concern have been furnishing Steel to Joshua S. Ingalls & Co. for some years. Kirkpatrick & Co., Limited, also intend putting in two additional Tin mills and changing their cold rolling plant, but nothing more than the above is contemplated at this time, and the firm are not considering any extensive changes or improvements in their present plant.

Thomas Goddard, head of the brass foundry firm of Thomas Goddard & Son of Jersey City, N. J., died at his home, in that city, on March 7, at the age of 67.

Chicago Report.

Scrap.—Very little Old Material is moving at present. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	...
Stove Plate (free of burnt)	4.00	...
Burnt Iron and Grate Bars	3.00	...
Sheet Iron and Hoops	2.00	...
Plow Steel and Breaking Stock	4.00	...
No. 2, such as Shovels, Hoes, &c	3.00	...
Old Boilers—whole (Iron)	3.00	...
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Business has fallen off again with the advent of springlike weather. Carload lots of 12 net tons or over are nominally quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

MINER & PECK MFG. COMPANY of New Haven, Conn., in addition to their regular line of the Peck Drop Press, are about to place on the market a line of Friction Drop Hammers. These Hammers possess new features, the result of long experience and study of the subject.

COLBY WRINGER COMPANY, Montpelier, Vt., advise us that notwithstanding the discouraging condition of general business during the past few months their factory has not shut down and they have not been obliged to discharge any of their men. They report a very encouraging increase in the demand for their Wringers, which has been quite noticeable since the opening of the new year.

SPRINGFIELD BRASS COMPANY, Springfield, Mass., are preparing to bring out a line of Brass Drawer Pulls, finished in gilt antique and nickel. These will be made in several styles and sizes. In connection with these goods, Knobs, Hat Hooks, Toilet Screws, &c., will be put on the market soon.

CONDITION OF THE

Hardware Trade.

THERE IS A GOOD DEAL of unevenness in the demand for Hardware and kindred lines, and some manufacturers report business relatively much better than do others. There is also considerable divergence in the reports of jobbing houses in different sections of the country. Some lines of goods are still moving sluggishly, but in others there is a perceptible increase in the demand. On the whole business may be referred to as showing signs of improvement, and the trade are placing orders more frequently. The demand is beginning to set in more freely from the retailers, whose orders are more diversified than they have been. Trade, it is thought, will show a marked increase with the approach of spring, and it is hoped that a fair if not a good business may be done during the next few months. Prices do not show any increased strength, and the tone of the market is rather toward lower quotations. The quotable changes are, however, comparatively few, but concessions from regular prices are more readily obtained by close buyers.

Advices from Chicago.—The Shelf Hardware trade has experienced a notable improvement since last report. The largest houses here state that their mail on Monday was the heaviest they have received so for this year. Every day recently has shown some gain. The changed character of the demand reported last week continued to be a conspicuous feature. While the demand for Nails and other staple goods is less than it has been, the trade in small goods and in straight Hardware is improving decidedly and business is thus gradually broadening to the satisfaction of jobbers. More new stocks have recently been bought, showing that additional stores are being opened in different parts of the Northwest, where the opportunities appear to be inviting for new ventures of this character. Heavy Hardware jobbers report that their total sales for February showed a slight gain for that month over January. The condition of business is thus shown to have been somewhat better than was expected during the month. The demand at present is moderate but not strong. Wagon stock is moving considerably better, but carriage goods are neglected. Collections have not been up to the average for the last two or three weeks, but are showing signs of improvment.

Notes on Prices.

Wire Nails.—The Wire Nail market continues in excellent condition and prices are well maintained. Nearly all the manufacturers are fully occupied on orders, and some complaint is made that Naila cannot be obtained as promptly as desired. The market is represented by the quotation of $1.10 for carload lots at factory, but on especially large and attractive orders a concession of 5 cents is made. On the other hand, some manufacturers are holding Nails at $1.12½ to $1.15.

Advices from Chicago.—Manufacturers' agents report that they are not pushing their customers for specifications for Wire Nails; the mills are sufficiently busy on orders coming in to make this unnecessary. In fact, complaints are being received from merchants who have contracts with the Wire Nail factories in this locality that they are not receiving shipments fast enough. One mill is known to be at least a month behind in its deliveries. Inquiries have fallen off, but there are some large buyers who would take in additional quantities at old rates if they were able to induce manufacturers to accept such terms. The jobbing trade is inclined to quietness, but that is because the retailers are now stocked and waiting for the demand for those who drive the Nails. The advent of spring weather is expected to cause a rapid growth in this demand in the course of the next week or two. A decided increase in business is reported by manufacturers of Wire Tacks, who have been meeting with great success in the introduction of such Tacks to the favor of the trade. Prices on factory lots of standard Wire Nails are continued at $1.20, Chicago, while small lots from stock are selling at $1.25.

Cut Nails.—The Cut Nail market has not developed any specially new features, the condition being substantially as for the past few weeks, with perhaps a slight weakening in the tone of the market. Manufacturers in the East are still adhering to their policy of quoting only prices for Nails delivered, and are naming $1.05 for carload lots, on dock, New York, but it is rumored that this figure has been shaded. The price from store in New York is steady at $1.15.

Advices from Chicago.—The volume of business in Cut Steel Naila is gradually growing larger. The manufacturers report continued sales in directions in which Wire Nails had until recently almost taken absolute control of the trade. This is true not only of the city trade, but also of localities in the country in which sales of Cut Nails had for some time fallen to very small proportions. The jobbers who have placed good sized contracts are sending in specifications promptly, showing that Naila are needed to supply the wants of the trade. Quotations on factory lots are unchanged at $1.05, Chicago, for 60-cent average. Small lots from stock are selling at $1.15 to $1.20.

Barb Wire.—The Barb Wire market is steady, with a good volume of business. Quotations for carload lots of Four-Point Galvanized are as follows: Pittsburgh, $2.15; Cleveland, $2 20; Cincinnati or Allentown, $2.25; Chicago or New York, $2.35. An ad-

vance of 5 cents per 100 pounds is made on carload lots.

Advices from Chicago.—The Barb Wire manufacturers are now engaged in the pleasant work of staving off deliveries, as they seem to be sold so far ahead that their customers are generally complaining about the non-appearance of goods in time promised. Some large buyers are endeavoring to secure shipments which were promised in April, claiming that they need a very much larger quantity than they had anticipated when they placed their orders. Small lots of Galvanized Barb Wire are quoted at $2.40, and carload lots at $2.30.

Household Specialties.—The following are the prices announced by Silver & Co., 304 to 310 Hewes street, Brooklyn, and 20 Warren street, New York, on their line of kitchen furnishing goods and household inventions, as shown in their catalogue of February, 1894. The jobbing prices announced are only given in consideration of an order for at leaat three dozen of a kind. Terms, f.o.b. New York and Brooklyn, cash in 30 days, with 2 per cent. discount for cash in 10 days:

Presses.

	Wholesale.	Jobbing.
Upright.....Per doz..	$7.00	$6.00
Hand..... " ..	3.00	2.50
Extra cups..... " ..	1.00	.75
Beef Tea..... " ..	3 50	3.00

Roasters, Royal.

No. 1.....Per doz..	$1.00	30 %	
No. 2..... " ..	1 25		
No. 2½ ..... " ..	1.35		30
No. 3..... " ..	1.50		and
No. 4..... " ..	1.75		10 %
No. 5..... " ..	2.50		

Roasters, Crown.

No. 1.....Per doz .	$0.65	30 %	
No. 2..... " ..	.75		
No. 2½..... " ..	.90		30
No. 3..... " ..	1.00		and
No. 4..... " ..	1.15		10 %
No. 5 ..... " ..	1.50		

Roaster Display Stands, each... $5.00 $5 00

Marion Harland Pots.

Tin Plate, Nickel Plated.

1 quart .....Each..	$0.90	33⅓ % 33⅓ %
2 " ..... " ..	1.20	
3 " ..... " ..	1.45	
4 " ..... " ..	1.65	

M. H. Pots, Copper.

	With Indicators.	Without Indicators.	
1 quart, each ...	$1.75	$1.45	33⅓ % 33⅓ %
2 " " ...	2.25	1.85	
3 " " ...	2.50	2.10	
4 " " ...	2.90	2.40	

Repairs, dozen Covers, $1.20; Filters, $3; Strainers, $1 20; Wire Cloth, $1.20; Glass, $1.20.

M. H. Coffee Urns

	With Indicators.	Without Indicators.	
2 quarts, each ..	$4.50	$4.00	33⅓ % 33⅓ %
3 " " ..	5.50	5.00	
5 " " ..	6.00	5.50	

One Cup Urns..... ..Per doz.. $3 25 $2.75

Egg Beaters.

S. & Co.'s New... .....Per doz...	10.00	9.00
" " Jars only " ...	3.25	3.00
M. G. Beater..... . " ...	5.50	4.95
" " Jars.... ... " ...	3.25	3.00
Egg Timers..... Per doz...	2.00	1.80

Sir H. D. Toasters.

Small..... . .....Per doz ..	2.50	2.00
Large..... ... " ..	2.75	2.25
Lamp Chimney Stoves, per doz...	.75	.60
Potato Peelers, Rapid, per doz....	.50	.40

Silver Flour Bins.

25 pound .....Each..	2.25	1.75
50 " .... " ..	3.00	2.50
100 " . . .. " ..	3.75	3.25

Pyramid Cookers.

No. 1..... .....Each..	1.50	1.25
No. 2..... ... ... " ..	2 00	1.50
No. 3.. ... . " ..	2.25	1.75

Cooking Crocks.

1 quart... ... .Per doz..	4.00	3.50
2 " ..... " ..	4.50	4.00
3 " .... " ..	5.25	4.75
4 " ... ... " ..	6.50	5.75

Egg Poachers.

3 Egg..... .....Per doz..	2.00	1.80
" .... " ..	4.00	3.60
Odorless Kettles, 12 quart..Each..	2 00	1.50
Bathtub Seats..... " ..	1.00	1.00
New Process Press.....Per doz..	5 00	4.50
Glass Rolling Pins ..... " ..	4.25	3.75
Baby Cleveland Lamps, per dozen	4.25	3.75
Family Measuring Glasses, per dozen	.78	.65
All Glass Squeezers, per dozen.....	1.50	1.30
No. 56 Squeezers, per dozen.....	.75	.6

Boss Coat Racks.

Brass. .... Per doz..	4.00	3.50
Nickel Plated ..... " ..	2.50	2.25
Japanned... ..... " ..	1.25	1.10
Sanitary Sink Baskets, per dozen.....	3.50	3.00

Soap Cups.

No. 1, Large, gal.....Per doz..	1.25	1.00
No. 1, " jap..... " ..	1.00	.75
No. 1, Small, gal. .... " ..	.90	.75
No. 1, " jap..... " ..	.75	.60

Novelty Cups.

Galvanized... ....Per doz..	2.50	2.00
Japanned .. .. " ..	2.00	1.75
No. 2, tinned..... " ..	2.25	2.00
No. 3, " ..... " ..	4.00	3 50
Automatic Gas Lighting Burners, per dozen	4.25	3.75
Yankee Roach Traps, per dozen.	2.25	2.00

Alcohol Stoves.

Queen..... ....Per doz..	7.00	6.00
Silver .... " ..	4.70	4.00
French Process..... " ..	4.25	3.75
Rapid..... ..... " ..	4.25	3.75
Pocket..... ..... " ..	2.00	1.50
Kettles..... " ..	1.00	1.00

Heaters.

Vim Stoves.....Per doz..	1.50	1.20
Globe Heaters..... " ..	9.00	9.00
Burner Stands..... " ..	2.50	2.25

No. 1 Oil Stoves.

No. 1, single..... ...Per doz..	21.00	21.00
No. 1, double.... ..... " ..	42.00	42.00
No. 1, X tops, single.. " ..	5.00	5.00
No. 1, " double. " ..	9.00	9.00
No. 1 Radiators.....Per doz .	7.20	7.20
Best Broilers..... " ..	6.00	5.50
No. 1 Oil Stove Ovens. " ..	15.00	15 00
Fire Cones..... ..... " ..	1.20	1.20

Silver Gas Stoves, Nickel Plated.

No. 1, polished, with cock, per dozen.....	9.00	9.00
No. 1, with nipple.....Per doz..	5.00	5.00
No. 2, nickel plated... " ..	15.00	15.00
No. 3, " ... " .	21.00	21.00

Rapid Gas Stoves.

No. 1, with cocks.....Per doz..	12.00	12.00
No. 2, black iron..... " ..	24.00	24.00
No. 3, " .. .. " ..	34.00	34.00

Novelty Gas Heaters.

No. 1..... .....Each.	5.60	4.80
No. 2... ..... " .	4.20	3.60
No. 3 .... " ..	2.80	2.40

Ruby Globes (Net Prices).

No. 1... ....$0.50 No. 2.....$0.75
No. 3..$1.00 each.

Ruby Globe Oil Heaters..Each..	5.60	4.80

Mammoth Egg Whisks.

No. 10.....Each..	8.00	8.00
No. 15..... ..... " ..	10.00	10.00
No. 20.... .. .. " ..	12.00	12.00
Silver Cookers, 10 gallon, each...	7.50	7.50
Westminster Stretchers, per dozen.....	12.00	9.60
Cigar Savers, per gross.... .....12.00		9.60
Sauce Pan Stands, wrought iron, each.....	3.00	2.75

B. & O. Sure Grip Foot Vise.—This Vise is manufactured by Butts & Ordway, Boston. It is sold to the trade at $10 net.

Sash Balances.—Pullman Sash Balance Company, Rochester, N. Y., issue the following revised price-list of Pullman Side and Top Balances, which is subject to a discount of 60 per cent.:

No.	Weight of each Sash. Pounds.	Hight of each Sash. Inches.	Per set.
0	4 and 5	30	$2.40
1	6 " 7	30	2.40
2	8 " 9	30	2.60
3	10 " 11	46	2.80
4	12 " 13	46	3.10
5	14 " 15	46	3.40
6	16 " 17	46	3.70
7	18 " 19	46	4.00
8	20 " 21	46	4 70
9	22 " 23	46	5 00
10	24, 25, 26	54	5.30
11	27, 28, 29	54	5.50
12	30, 31, 32	54	5.70
13	33, 34, 35	54	5.90
14	36, 37, 38	54	6.10
15	39, 40, 41	54	6.70
16	42, 44, 46	54	7.25
17	48, 50, 52	54	9.25
19	54, 56, 58	54	10.00
21	60, and 62	54	10.50
23	64 " 66	54	10.75
25	68 " 70	54	11.00
27	72 " 74	54	11.50
29	76 " 78	60	12.00
31	78 " 80	60	12.50
33	82 " 84	60	13.00
35	86 " 88	60	13.50
37	90 " 92	60	14.00
39	94 " 96	60	14.25
41	98 " 100	60	14.50

Referring to the change in prices on these goods, the manufacturers remark, in a circular letter to the trade, that they consider it best to use a high list and a large discount in order that dealers may be given an opportunity of realizing more margin of profit than by using a low list and small discount.

Glass.—The first week in March has not witnessed any strengthening in Glass prices, although some improvement is noticed in demand. It is reported that there has been a decrease in the productive capacity of the country during the past week, equivalent to 24 pots. Many of the factories which have gone out of operation have no stock of Glass on band and are dependent upon those in operation to fill immediate orders. Other factories are quoting Glass for delivery up to July 1, which is the regular time for closing all factories for the summer. Pittsburgh quotations remain unchanged at 85 and 10 and 5 per cent. discount for single and 85 and 20 and 5 for double strength Glass. It is understood that single strength Glass has been quoted at 85 and 10 and 7½; and that for immediate shipment 88 and 89 per cent. discount has been quoted for single and 90 per cent. discount for double strength. New York prices for French Window Glass are represented by a discount of 80 to 80 and 20 per cent. discount, and French Plate by 75 and 10 and 5 per cent. discount.

Old Metals.—The market for Old Metals continues dull, with prices at the lowest notch. There is, however, a little more movement in certain descriptions of Scrap Iron, and the stock in dealers' hands does not appear to be increasing; therefore, it is believed that prices can hardly go much lower. The following quotations represent about the prices paid by dealers delivered in New York:

Heavy Copper.....	℔ lb 7¢
Light and Tinned Copper.....	℔ lb 6¢
Heavy Brass.....	℔ lb 5¢
Light Brass.....	℔ lb 4¢
Lead.....	℔ lb 3¢
Tea Lead.....	℔ lb 2½¢
Zinc.....	℔ lb 2¼¢
No. 1 Pewter.....	℔ lb 13¢
No. 2 Pewter.....	℔ lb 6¢
Wrought Scrap Iron.... gross ton.....	℔ $7.00 @ $8.00

Heavy Cast Scrap.....℔ gross ton.....	7.00	@	8.00
Stove Plate Scrap.....℔ gross ton.....	4.00	@	5.00
Burnt Iron, ℔ gross ton...	2.50	@	3.00

Old Rags, Paper, &c.—Business in these materials is slightly better, yet still considerably below the average for the season. Prices show no material change. Quotations are given as follows:

No. 1 White Rags.....℔ lb	3¼	@	3⅓¢
No. 2 White Rags.....℔ lb	2¾	@	2⅞¢
Mixed Rags.....℔ lb			2¼¢
Blues and 3ds.....℔ lb	1	@	1¼¢
Hard Sized White Shavings℔ lb	2¼	@	2⅓¢
No.1 White Book Shavings ℔ lb	2	@	2⅛¢
No.2 White Book Shavings℔ lb	1	@	1⅛¢
Light Book Shavings.....℔ lb			¾¢
No. 1 Mixed Shavings. ...℔ lb	¾	@	1 ¢
No. 2 Mixed Shavings.....℔ lb	½	@	¾¢
No. 1 Printed Books .....℔ lb	1	@	1¼¢
Ordinary Mixed Books....℔ lb	½	@	¾¢
Newspapers ....℔ lb	2-5	@	½¢
No. 1 Manila Paper .....℔ lb	1	@	1⅛¢
No. 2 Manila Paper.....℔ lb	⅞	@	¾¢
Bogus Paper.....℔ lb			½¢
Common Paper.....℔ lb			⅜¢
Straw Chips.....℔ lb			⅛¢
Binders' Clippings.....℔ lb	½	@	⅝¢
Jute Butts..... ....℔ lb	1⅞	@	2 ¢
No. 1 Jute Bagging.....℔ lb	1	@	1¼¢
Mixed Bagging.....℔ lb	¾	@	1 ¢
No. 2 Bagging.....℔ lb	½	@	¾¢
Hemp Twine.....℔ lb	2	@	2¼¢
Manila Rope.....℔ lb	2¼	@	2⅝¢
Jute Rope.....℔ lb	1½	@	1⅝¢
Mixed Rope.....℔ lb	⅝	@	⅞¢

Old Rubber.—There is very little doing in Old Rubber, and prices remain at the low level they have held for some time past. The following quotations represent about the rates paid in New York.

Car Springs, ton lots, ℔ lb.	@	$0.03¼	
Rubber Shoes, carloads, delivered at factory, ℔ lb..	@	.03	
Rubber shoes, less than carloads, ℔ lb.....0.02¼	@	.03⅛	
Large Hose, ℔ ton.....	@	9.00	
White Wringer Rolls, ℔ lb.	@	.04¼	
White Syringes, ℔ lb.....	@	.05	

Trade Notes.

AN INTERESTING ASSORTMENT of Tinware is noted in the advertisement of the Geuder & Paeschke Mfg. Company, St. Paul avenue and Fifteenth street, Milwaukee, Wis. Cream Cans, Dairy Pails and Watering Pots of different sorts are referred to.

AN ADVERTISEMENT on another page of I. W. Numan, 104 East Fourth street, Canton, Ohio, directs attention to Numan's New Fruit Tree Sprayer with extension for high spraying. An illustration shows the application of the device.

IN REFERRING, in *The Metal Worker* of March 3, to a circular that had been issued by Francis I. Maule of Philadelphia, a typographical error appeared in the address. Mr. Maule is located at Room 40, 328 Chestnut street, Philadelphia.

THE ANNOUNCEMENT ELSEWHERE of the J. H. McLain Company, Canton, Ohio, with offices at Boston, New York, Chicago and San Francisco, directs attention to the Humber Hot Water Heaters, which are made in 20 sizes for hard or soft coal.

THE FERRACUTE MACHINE COMPANY, Bridgeton, N. J, manufacturers of Presses and Dies, report that business is improving and that they are receiving orders for their new styles of Presses, which were exhibited at the Chicago fair, some of them having proved especially popular. Among others they are building a new style of adjustable bed combination Press which can be used for horning, seaming, wiring, curling, cutting and forming. It is very convenient and a great improvement on other Presses of this kind now on the market. They have recently issued a small catalogue illustrating their various styles of Presses. They manufacture over 300 different kinds of Presses, all kinds of Dies and many other sheet metal tools.

COLBY WRINGER COMPANY, Montpelier, Vt., have made arrangements with Surpless, Dunn & Alder, 97 Chambers street, New York, by which the latter will represent them directly to the trade throughout the country.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

M. V. WOODWARD has just received the contract for plumbing and steam heating the new residence of Capt. B. F. Peet, near the lower wharf, Southport, Conn.

BIDS will be received up to March 15 for a system of hot air heating and ventilation and sanitary dry closets for a 16-room school building by the Board of Education of McKeesport, Pa.

DAVIS & JOHNSON will erect at Oak Park, Chicago, at a cost of $12,000, a two-story flat building to have furnace heat and a system of plumbing.

BIDS will be received up to March 31, at the office of Joseph Leicht, Winona, Mich., for a steam heating plant for the Philharmonic Society Building. Bids will also be received for a fan system. Guarantee will be required to heat the building to 70° with the outside temperature at 30° below zero. Not less than 1 square foot of radiating surface must be provided for 30 cubic feet of space.

J. W. GREENWOLD has been awarded the plumbing contract at $4300 for the National Union Building, at Toledo, Ohio.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until March 27 for the interior work, plumbing, &c., of the United States Post Office building at Fort Dodge, Iowa. Drawings and specifications may be obtained from the office of the Supervising Architect, Washington, or can be had from the superintendent at Fort Dodge.

THE STEAM HEATING PLANT installed in the Eighth Precinct Station House and police headquarters, on Macdougal street, near Spring street, New York, has been formally accepted. The work was done by Higgins & Co., 379 Lexington avenue, who use a Richmond Sectional steam boiler.

THE D. F. MORGAN BOILER COMPANY, 23-25 West Lake street, Chicago, have the contract for steam heating in the apartment building of Trebilcock & Penhalligan, Stewart avenue, near Sixty-fourth street.

WALLACE & MCNAMARA, Des Moines, Iowa, have secured the contract for the steam heating in the Lutheran College, Jewell Junction, Iowa. An American boiler will be used.

KEHM & MERTZ, steam heating contractors, 289 East Kinzie street, Chicago, are to furnish the boilers and steam heating plant for the Gormully & Jeffery Mfg. Company's addition to their bicycle factory, at Pearson and Franklin streets.

T. B. CRYER & Co., Newark, N. J., recently installed a No. 26 Perfect hot water apparatus in the residence of Bank President Elliott, at Goshen, N. Y. There were 800 feet of radiation, and the system contained about 400 gallons of water, and in 15 minutes after the fire was lighted warm water was being returned to the boiler.

THE MOORE HOTEL, at Shelby, Mich., has been purchased by D. S. Rankin and A. G. Avery, who will remodel it and put in a steam heating plant.

RUFE BROS. have received the contract for an extensive steam heating outfit for a new hall, 100 x 50 feet, and three stories high, just built by the Harmonia Singing Society at Chester, Pa.

DANIEL ROCK, 86 North Clark street, Chicago, has the contract for the plumbing, sewerage and gas fitting in the residence of M Reissnider, Lake View.

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Metal and Miscellaneous Prices.

CHICAGO, MARCH 8, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100℔	.5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	.11.30 @11.50
X, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC,10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@
IC, 20 x 28	.12.25 @
IX, 14 x 20	7.62½@
20 x 28	.15.25 @

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20	.$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20	.$7.00
IX, 10 x 14, 12 x 12, 14 x 20	9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.50
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Rooding, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Rooding, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00
Old Process:	
IC, 14 x 20	9.25
IX. 14 x 20	11.25
IC, 20 x 28	18.50
IX, 20 x 28	22.50
H. B. L., Old Style:	
IC, 14 x 20	7.75
IX, 14 x 20	9 25
IC, 20 x 28	15.50
IX, 20 x 28	18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 5-10¢	3 1-10¢
17 to 20	℔ 2 6-10¢	3 2-10¢
21 to 24	℔ 2 7-10¢	3 3-10¢
25 and 26	℔ 2 8-10¢	3 4-10¢
27	℔ 2 9-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.. dis.70&10@75%

Copper—

Ingot.

Lake.....11¢ @ 11½¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount, 30%.

Copper Bottoms.

Discount, 30%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass	

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....4¾¢
300 ℔ casks.....5 ¢
Loose sheets.....5¼¢

Lead—

Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12½¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	60%
1¼ and under, Galv	52½%
1¼ and over, Plain	70%
1¼ and over, Galv	60%
Boiler Tubes, list Oct. 24, 1892	70%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ 2, ¢
" " Brown	℔ 2, 1½¢
" " Purple	℔ 2, 2½¢
" Ground in oil, B. Red	℔ 2, 6½¢
" Ground in oil, Red	℔ 2, 6½¢
" Ground in oil, Brown	℔ 2, 5½¢
" Ground in oil, Purple	℔ 2, 6 ¢
Linseed Oil, Boiled, in oals	53¢
Linseed Oil, Raw, in bbls	2@4¢
Mineral Paints	9¼¢
Orange Mineral	6@6½¢
Pure White Lead in Oil	5@5½¢
Dry White Lead in bbls	6@6½¢
Red Lead, American	Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal	36½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, MARCH 9, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:

Small lots	℔ ℔, 75¢
100-℔ lots	℔ ℔, 72¢
Ton lots	℔ ℔, 70¢

No. 1 Aluminum guaranteed to be over 98% pure), in ingots for remelting:

Small lots	℔ ℔, 70¢
100-℔ lots	℔ ℔, 65¢
Ton lots	℔ ℔, 60¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	℔ ℔, 05¢
100-℔ lots	℔ ℔, 00¢
Ton lots	℔ ℔, 55¢

Antimony—

Cookson.....℔ ℔, 10¾¢
Hallett's.....℔ ℔, 10¼¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

25@30%

Copper and Bronze Tubing—

8¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3⅛ inches inclusive....17¢ ℔ ℔
Over 3¼ to 5 inches inclusive.....18¢ ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 2¼ inches inclusive....18¢ ℔ ℔
Over 2¼ to 5 inches inclusive.....19¢ ℔ ℔

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake	11¢
Ansonia Grade Arizona	10¼¢
Ansonia Grade Casting	9¾¢

Planished......net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips, Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint, Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized	85%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.

Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2.60	2.90¢
Nos. 17 to 20	℔ ℔, 2.70	3.00¢
Nos. 21 to 24	℔ ℔, 2.80	3.10¢
Nos. 25 and 26	℔ ℔, 2.90	3.20¢
No. 27	℔ ℔, 3.00	3.30¢
No. 28	℔ ℔, 3.05	3.40¢
American B. B.	℔ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11¾@12½¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ ℔, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75@75&5%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—

Lee's.....33⅓%

Lead—

American Pig	3½¢@4¢
Bar	4¼¢
Pipe	5¾¢, 20%
Tin Lined Pipe	16¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	6½¢, 20%

Old Lead in exchange, 2¾¢ ℔ ℔.

Metal Exoanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¾
Lead, Red, bbls. and ⅛ bbls	6¼ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01⅝ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01½ @ .02⅛
In bladders..... .01⅝ @ .02⅛

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.17@$1.18
Rosin, E. & F..... ₩ bbl. $1.25@$1.45
Rosin, G. & H..... ₩ bbl. $1.65@$1.90
Rosin, I. & K..... ₩ bbl. $2.20@$2.60
Rosin, M. & N..... ₩ bbl $2.90@$3.00

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.60@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.26
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.60
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ¼..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
3bls., about 500 ℔, ₩ ℔..... 3½¢
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
75¢ extra for keg. 5% dis.
Kegs, about 55 ℔, ₩ ℔..... 4¢

Yager's Soldering Salts.
¼-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢@4½¢
Hertha (pure)..... 8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 21½¢
Straits, pigs, ₩ ℔..... 20½¢ @ 21¢
Straits in bars, ₩ ℔..... 22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20	$7.00
Alderly, extra quality, IC, 14 x 20	6.37½
Allegheny, IC, 14 x 20	6.12
" IX, 14 x 20	6.38
Apollo Roofing, IC, 14 x 20	5.50
" IX, 14 x 20	6.50
Atlantic, IC, 14 x 20	5.75
Bonus, Extra Coated, IC, 14 x 20	6.75
" " " IX, 14 x 20	8.25
Buckeye, IC, 14 x 20	7.00
" IX, 14 x 20	8.25
Chicago, IC, 20 x 28	11.50
Central, IC, 14 x 20	5.37½
Climax, IC, 14 x 20	5.55
Columbia, IC, 14 x 20	7.00
Crescent, IC, 14 x 20	6.00
Dane, IC, 14 x 20	5.50
DeMilt's First New York, IC, 14 x 20	5.75
" First New Jersey, IC, 14 x 20	5.50
" Mohawk, IC, 14 x 20	5.50
Dunlap's Double Dipped, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.50
" Domestic, IC, 20 x 28	12.00
" " IX, 20 x 28	15.00
Empire, IC, 14 x 20	6.12½
Extra Central, IC, 14 x 20	5.62½
Flag, IC, 14 x 20	5.25
Fort Pitt, IC, 20 x 28	11.00
Globe, IC, 14 x 20	5.75
Hamilton's Best Redipped, IC, 14x20	9.25
" " " IX, 14x20	10.75
Hickory (Resquared), IC, 14 x 20	6.37½
Juno, IC, 14 x 20	5.75
Kensington, IC, 14 x 20	6.75
" IX, 14 x 20	8.00
Knoxall, IC, 14 x 20	6.00
Laufman's Apollo (Resquared), IC, 14 x 20	8.12
Laufman's Apollo (Resquared), IX, 14 x 20	9.37
Leominster, Extra Coated, IC, 14x20	7.25
Lion (Stamped), IC, 14 x 20	6.25
Lula, Best Charcoal, IC, 20 x 28	12.50
" " " IX, 20 x 28	16.00
Manhattan, IC, 14 x 20	7.00
Maple, IC, 14 x 20	6.50
Merchant's Old Method (Resquared), IC, 14 x 20	9.50
Merchant's Roofing (Resquared), IC, 14 x 20	8.50
McKinley, IC, 20 x 28	12.00
" IX, 20 x 28	16.00
Newcastle Real Old Method, IC, 14x20,	9.50
" " " IX, 14x20,	11.50
Newcastle Genuine Extra Coated, IC, 14x20,	8.75
" " " IX, 14x20,	9.75
Newcastle Shenango, IC, 14x20	6.12½
" " " IX, 14x20	7.62½
Neville, IC, 14 x 20	6.00
" IX, 14 x 20	7.25
N. F. Old Style, IC, 14 x 20	7.50
" " " IX, 14 x 20	9.00
Old Colony, IC, 14 x 20	8.00
Optimus, Best Redipped, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.50
Osceola, Hand Coated, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.75
Pacific, IC, 14 x 20	5.25
Palacio, IC, 14 x 20	5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20	8.00
Phœnix, IC, 14 x 20	5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20	9.25
Scott's Extra Coated (Resquared), IX, 14 x 20	10.75
Taylor Old Style (Resquared), IC, 14 x 20	9.25
Taylor Roofing, IC, 14 x 20	8.00
Thomson's Puritan, IC, 14 x 20	5.75
Tip Top, IC (Resquared), 14 x 20	6.62
" IX " 14 x 20	7.88
U. S. Monongahela, IC, 14 x 20	6.50
U. S. Redipped, IC, 14 x 20	9.25
Venus, IC, 14 x 20	5.37½
Vigilant, IC, 14 x 20	5.50
Waldo Redipped, IC, 14 x 20	6.75
Westmoreland, IC, 14 x 20	6.25
Wilkinsburg Redipped, IC, 20 x 28	16.00
" IX, 20 x 28	19.00
Willow, IC, 14 x 20	6.26

American Bright Plates—

Almond, IC, 14 x 20	$6.25
Brilliant (Tissue Packed), IC, 14x20	9.00
Climax, IC, 14 x 20	6.00
" IX, 14 x 20	7.50
Florence, IC, 14x20	6.75
Hazel, IC, 14x20	5.80
Iowa, IC, 14 x 20	5.75
" IX, 14 x 20	7.00
Linden, IC, 14x20	6.50
Merchant's Dipped, IC, 14x20	11.00
Merlon, IC, 14x20	6.75
Mint, IC, 14x20	6.00
Newcastle Russia, IC, 14 x 20	7.00
" " IX, 14 x 20	9.00
Newcastle Juniatt, IC, 14 x 20	6.50
" " IX, 14 x 20	8.50
Newcastle Best Coke, IC, 14 x 20	6.00
" " IX, 14 x 20	7.25
Newcastle Coke, IC, 14 x 20	5.50
" " IX, 14 x 20	6.75
Palma Xtra, IC, 14x20	7.25
Phœnix, IC, 14x20	6.25
" IX, 14x20	7.75
Royal, Extra, IC, 14x20	7.00
U. S., IC, 14x20	7.25

Imported Terne Plates—

Charcoal.

Dean Grade.—IC, 14 x 20	$5.37½
20 x 28	10.75
IX, 14 x 20	6.40
20 x 28	12.80
Abercarne Grade.—IC, 14 x 20	6.25
20 x 28	10.50
IX, 14 x 20	6.40
20 x 28	12.80

Imported Bright Plates

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Calland Grade.	IC, 10 x 14	$6.37½
" "	IC, 12 x 12	6.62½
" "	IC, 14 x 20	6.37½
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.87½
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
"	DC, 12½ x 17	6.50
"	DX, 12½ x 17	6.50

Coke.

Steel Coke.—IC, 10x14, 14x20	$5.25@$5.35
10x20	8.12½
20x28	11.00
IX, 10x14, 14x20	6.60
B. V. Grade.—IC, 10x14, 14x20	5.40

Imported Boiler Plates.

IXX, 14x26..(112 sheets)	$13.35
IXX, 14x28..(112 sheets)	14.50
IXX, 14x31..(112 sheets)	16.00

Tinning—

Brass and Copper..... ..net

Tubing—

Tin	55%
Galvanized	55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz.	$15.00
Steel Lock Frame, per doz.	18.00
Daisy Improved Pattern, ₩ doz.	18.00

Zinc—

600 ℔ casks..... ₩ ℔ 4¾¢
Per ℔..... 5¼¢

It Is Reported—

THAT W. J. Knowles and W. G. Nott have dissolved their partnership in the Hardware business at Brantford, Ont., Mr. Knowles retiring to devote his entire time to the management of the Goold Bicycle Company and the Knowles, Ham & Nott Company. He has been succeeded by Walter R. Turnbull, the name of the new firm being Nott & Turnbull. Mr. Turnbull has been connected with J. Y. Morton & Co. for the past six years. Mr. Nott has been identified with the business for over seven years. Improvements are contemplated in the present premises. Among other things they will have a plate glass front. The establishment will also be materially enlarged.

That McClellan & Sons Hardware store, at Troy, Kan., was badly damaged by fire on the 16th ult.

That the Hardware store of Keefer Bros., Olathe, Kan., was broken into by burglars on the 14th ult., and seven double barrel Shot Guns and one Repeating Rifle, worth over $200, were stolen. Entrance was effected by cutting through a large plate glass window in front.

That the Jones Hardware Company have been organized at Richmond, Ind. The capital stock of the company is $25,000. The directors are Sharon E. Jones, Clement W. Carr and James W. Carr.

That the Hardware store of Albrecht Bros., Wahpeton, N. D., suffered damage by fire to the extent of $5000 on the 15th ult.

That the Hardware store of O. A Martin, Fox Station, Ind., was burglarized of $25 worth of Revolvers on the 11th ult.

That Millspaugh & Drake's Hardware store, at Corning, N. Y., was damaged by fire and water on the 14th ult. The loss is fully covered by insurance.

That Peterson & Boyson, Hardware dealers, Lyle, Minn., have dissolved partnership. H. N. Peterson will continue the business alone.

That John F. Peck of Gardner, Ill., will open a new Hardware store at Virginia, Ill.

That on the 15th ult. burglars raided the Hardware store of L. B Shapland, Guthrie, O. T., and got away with a large quantity of Guns, Ammunition and Revolvers.

That the Crary Hardware & Stove Company, as successors to Crary & Parsons, have been organized at Delevan, Wis. The incorporators are Henry G. Hollister, E. M. Crary, H. C. Hollister and Charles L. Crary. The officers are H. G. Hollister, president; E. M. Crary, secretary, and Chas. L. Crary, manager.

That F. L. Thompson and J. M. Lewis have purchased the Hardware stock of the late J. T. Cadby, Muscoda, Wis., and have formed a partnership to carry on the business.

That the style of the Hardware firm of G. W. Anderson & Co., Griswold, Iowa, has been changed, and the firm will hereafter be known as J. L. Anderson & Son.

That E. A. Stephenson, Lowell, Iowa, is erecting an addition to his Hardware store, and will place in it a line of Farm Implements and Farm Machinery.

That the Hardware business at Omro, Wis., formerly the property of Fred. Bunker, but recently in the possession of S. J. Seabury, has again changed hands, the purchasers being Imig & McNulty of Waukesha, who will hereafter conduct the store.

That A. L. Richardson of Van Wert, Iowa, has purchased a Hardware store at Promise City.

That E. M. Allen, Hardware merchant, Hastings, Neb., has disposed of his stock of goods to William Ohlheiser.

That the Hardware firm of H. W. Crane & Co., Mt. Pleasant, Iowa, have sold out to a new firm under the style of T. A. Niece & Co.

That by a fire on the 21st ult., Richards Bros., Hardware dealers, East Tawas, Mich., lost $12,000.

That the Palmer Hardware Company, Rockford, Ill., have greatly enlarged their establishment, having leased the store adjoining it.

That the Hardware store of Justus, Rogers & Co., Bluffton, Ind., was burglarized on the 17th ult.

That Chas. Brent, Smithshire, Ill., has sold his stock of Hardware to M. S. Yoho of Ellison.

That about March 1 A. N. Bucklin & Co., Grand Junction, Col., will remove their Hardware stock into larger quarters.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

At once, a TINNER who understands retinning old tinware. Louis Dyer, 44 Dekalb avenue, Brooklyn, N. Y. Mar. 10

A FOREMAN for a wood pattern shop for stoves; must be a first-class draftsman and designer; references required. "D. and D.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 10

SALESMEN to carry our specialties, &c., on commission as a side line in Pennsylvania, Ohio, and the New England States. Clifton Springs Mfg. Company, Clifton Springs, N. Y. Mar. 10

At once, a STOVE PATTERN MAKER; one that is experienced in making wood patterns for stoves; state wages and give references. A. J. Lindemann & Hoverson Company, Milwaukee, Wis. Mar. 10

A first-class TINSMITH who can invest $500, to manufacture milk coolers; write at once to H. W. Gazlay, Cortland, N. Y. Mar. 10

A first-class PLUMBER, STEAM and GAS FITTER; one having a fair knowledge of tin and furnace work; must be temperate. Address, with stamp, "Plumber and Tinner," 513 Central avenue, Fort Dodge, Ind. Mar. 10

TIN LITHOGRAPHY; a man who is an artist and engraver; submit samples if possible; state experience and wages expected. The McClary Mfg. Company, London, Ontario. Mar. 10

SALESMAN to handle as side line on commission Dockash line of stoves and ranges; Illinois, Southern Iowa, Nebraska, Missouri. Judson A. Tolman, 28, 30 and 32 Van Buren street, Chicago, Ill. Mar. 10

Enterprising parties to handle on commission a greatly improved patent ventilator for roofs, chimneys and vent pipes. "P. A. C. Co.," room 12, 18 South Broad street, Philadelphia, Pa Mar. 3

A good boy between 16 and 18 years of age to learn the tinning and plumbing trades, one who will serve for three years and board with employer. A. M. Kreider, Lititz, Pa. Mar. 3

A first-class man who understands TIN and SHEET IRON WORK, PLUMBING, IRON PIPE WORK and GENERAL JOBBING; steady work to the right man; must be steady and sober; state experience, age and salary. Brown Bros., Lebanon, N. H. Mar. 3

A practical STOVE PATTERN FITTER; sober; must be well recommended. "Superintendent," Box 33, office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 3

A young married man, 25 to 30 years old, who has had experience in bookkeeping and buying in a large cornice and tin jobbing works, or has experience in a wholesale and retail tinners' supply house; must be a good penman, quick and accurate at figures; state all places where formerly employed, how long in each place, cause of leaving and duties performed; best of references and bond required; state salary expected; answer above questions fully or no communications will be considered. "Bookkeeper & Buyer," office of *The Metal Worker*, Bank of Commerce Building, St. Louis, Mo. Mar. 3

SITUATIONS WANTED.

HEATING and VENTILATING ENGINEER wishes to make a change; has had seven years' experience in warm air heating and ventilating, and can sell, estimate and superintend installation of work; best of references, and can carry a trade with him; moderate salary and steady position desired. J. H. Giles, Elmira, N. Y. Mar. 10

By the year, with first-class hardware house; advertiser is married, steady and sober; 17 years' experience in tin, copper and sheet metal business; first-class cornice cutter; willing to work in Missouri, Arkansas or Texas, the latter State preferred. J. F. Rucker, Rosebud, Texas. Mar. 10

By practical TINSMITH at all branches of the tin and sheet iron trade, furnace, stove, fire place heater, tin roofing, pump and iron pipe work and general jobbing; married; temperate. E. G. Braumgard, 312 Van Buren street, Chicago. Mar. 10

Steady work, by a first-class PLUMBER. J. Becker, 235 East Ninety-fourth street, New York City. Mar. 10

By a first-class PLUMBER. J. P. Hayes, 1660 Third avenue, New York City. Mar. 10

By an experienced TINSMITH. E. Gold, 62 Boerum street, Brooklyn, N. Y. Mar. 10

By a first-class PLUMBER and STEAM FITTER; some knowledge of tin and sheet iron work; city or country; references; tools. W. F. Farrell, Box 276, Mt. Carmel, Pa. Mar. 10

By a first-class PLUMBER; in country or city. George Foley, 267 Wyckoff street, Brooklyn, N. Y. Mar. 10

By an A1 practical PLUMBER, in city or country; first-class wages. Richard Riely, 36 Verandah place, Brooklyn, N. Y. Mar. 10

By a first-class PLUMBER, in the country; first-class wages. Joseph Kelly, 1103 Third avenue, New York City. Mar. 10

By a first-class man at plumbing, hot water and steam heating, furnace and blow pipe work, and all kinds of tin and sheet iron work; can set tile and do brick work of brick set furnaces and boilers; estimate from plans; held position as foreman for years; good references. H. George, care of Schwarts, 561 Broadway, Brooklyn, E. D., N. Y. Mar. 10

Experienced MANAGER and SUPERINTENDENT desires situation; understands modern methods of economical manufacture, designing and constructing metal patterns, cast and malleable iron foundry work, steam and hot water heating; specialty: goods pertaining to the steam and gas pipe trade; unexceptionable references. "R," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Mar. 10

By a steady, reliable man, 34 years of age, who understands all kinds of heavy sheet iron work, boiler making and tank building; can lay out work, and fit up, &c. R. Campbell, 16 Oak street, Kearney, N. J. Mar. 10

As FOUNDRY FOREMAN; understands making pipe fittings; can get up plates and drop patterns for making castings; good references. "W. H. G.," 137 State street, Sing Sing, N. Y. Mar. 10

By a competent man, as CUTTER on metal cornice work; first-class bench workman; best of references. "H.," No 310, office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 10

By a man with nine years' experience at furnace work and general jobbing; would also go as clerk; German; city or country. W. F. Gritzmocker, Le Sueur, Minn. Mar. 10

By a TINNER with four years' experience at general line of tin work, roofing and spouting and some knowledge of furnace work; single, steady and temperate; would like a steady job; references furnished. Percy W. Pyfer, Forreston, Ill. Mar. 10

By a practical TINSMITH, capable of doing tin and sheet iron work, roofing and general jobbing; 18 years' experience; city or country. H. Gold, 92 Essex street, New York City. Mar. 10

As TINNER; have had 12 years' experience at inside and outside general job work and tinware, also pump and pipe work; 28 years old and single; small city preferred. "Y. Z.," care of Chas. Dellman, 602 East Sixth avenue, Pine Bluff, Ark. Mar. 10

By a ROUGE BUFFER, eight years' experience with the Meriden Britannia Company of Meriden, Conn., on knives, forks, spoons, &c.; also one year's experience on hollow ware and light nickel for Gaitley of Troy, N. Y. Edward W. Hoag, Old Chatham, N. Y. Mar. 10

By a PLUMBER; steady; willing to go to any part of the country. J. Fitzpatrick, 229 Broadway, New York City. Mar. 10

BRASS MOLDER or WORKING FOREMAN, by a steady man of large experience in the mixing and melting of metals for any class of work, heavy or light; location no object; good references. "H. A. H.," 36 Sampson street, Allegheny, Pa. Mar. 10

An experienced stove man wants to handle a line of stoves, ranges and hollow ware; salary or commission. "R. L. S.," South Bend, Ind. Mar. 10

By a young man 26 years of age, with 13 years' experience on French cooking ranges; good sheet iron worker. J. E. Dupont, 227 South Waters street, Sheboygan, Wis. Mar. 10

By a TINSMITH and PLUMBER; 16 years' experience at all branches of the trades; German; steady and sober; married; country preferred. "Tinner," care of cigar store, 339 East Twenty-second street, New York City. Mar. 10

By a TINSMITH who thoroughly understands his trade; 16 years' experience at roofing, spouting, furnace, pump and pipe work and plumbing; country preferred; good references as to ability. G. Rourke, 925 Pacific street, Brooklyn, N. Y. Mar. 10

Steady situation desired by a first-class TIN and SHEET IRON WORKER; good references. Max Naumann, 300 East 104th street, New York City. Mar. 10

As CUTTER and FOREMAN, by a first-class cornice and skylight maker; thoroughly posted in all the details; steady and sober and not afraid of work; can give best of references; New York or Brooklyn preferred. "W.," Box 2, 261 Atlantic avenue, Brooklyn, N. Y. Mar. 10

By a SANITARY PLUMBER; married; strictly temperate; wants a position in any part of the United States; can work both iron and lead; good references. C. Spencer, 185 Seymour street, Auburn, N. Y. Mar. 10

By a TRAVELING SALESMAN; stove line, gas stoves or a specialty preferred; well acquainted all over east of Mississippi River; references strictly A1; salary very reasonable. R. Williams, with the Wolff Gas Radiator Mfg. Company, 164 Franklin street, New York City. Mar. 10

By a first-class PLUMBER; willing to work in city or country; can furnish excellent references; 11 years' experience. Frank Miller, 124 Boulevard, New York City. Mar. 10

By a first-class PLUMBER; city or country; best of references; 13 years' experience. GEO. A. Blessing, 2359 Eighth avenue, New York City. Mar. 10

By a TIN and SHEET IRON WORKER; 14 years' experience; understands roofing, pump and furnace work and general jobbing; can make up tinware; country preferred. J. Moble, 35 Swan street, Trenton, N. J. Mar. 10

By a PLUMBER who understands hot water fitting; willing to go East, West or South; a growing town preferred; sober; good references furnished; state wages. "A. B. C.," care John Flynn, 331 West Seventeenth street, New York City. Mar. 10

By a TINNER; five years' experience at outside work and general jobbing; also good at furnace work and iron piping. "Tinner," Box 58, Madison, N. J. Mar. 10

By a young man 30 years of age, as CLERK in retail hardware store or good position in a wholesale hardware house; practical TINSMITH; 15 years' experience in the hardware business, both city and country; willing to go as traveling salesman; good references. P. O. Box 82, Westfield, Pa. Mar. 10

As TINSMITH, ROOFER and GENERAL JOBBER; city or country. John Klein, 616 Fulton street, Elizabeth, N. J. Mar. 10

As TRAVELING SALESMAN for bicycles or sporting goods of any kind; understands the repairing of wheels, &c.; two years' experience on the road; A1 references. "J. H. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 10

With stove foundry or manufacturing concern: have held positions in large concerns as superintendent of manufacturing department, also as steam and hot water heating engineer, and as correspondent and advertising man; capable of taking charge of either branch; will make satisfactory terms if prospects are fair. "D.," Box 2, 142 East Forty-eighth street, New York. Mar. 10

By cornice cutter and draftsman, as CUTTER or FOREMAN; am first-class mechanic at all kinds of sheet metal work; first-class reference given. T. A. Hughes, 132 Seventh street, N. E., Washington, D. C. Mar. 10

Steady position desired by a young married man; five years' experience as clerk in hardware store; eight years at tinning, roofing and general jobbing; best of references. "E.," P. O. Box 176, Middletown, Pa. Mar. 10

Steady work, or as long as possible, by a thoroughly practical TINNER; one who understands and can do all kinds of outside and inside work, such as roofing, cornice, repairing, general jobbing, stoves, tinware, &c; sober; unmarried, and energetic; good references. J. S. Burch, Vesta, Tenn. Mar. 10

By a sober, industrious MECHANIC, who can do tin, sheet iron, furnace and cornice work, estimate from plans and lay out patterns; willing to go on trial two weeks at reasonable wages. "J. L.," 128 Jacunda street, Pittsburgh, Pa. Mar 10

By a first-class practical CORNICE CUTTER, as foreman or cutter. Thomas McNamara, 28 Devoe street, Brooklyn, N. Y. Mar. 10

Steady position, by a young man capable of doing all work done in a practical tin shop; good references; single. Frank A. Fleck, Middletown, Pa. Mar. 10

As TINSMITH, by a young man of good habits, steady and reliable; can do tin, slate or iron roofing, pieced work and general jobbing; have been employed by a large cotton mill as tinsmith for nearly two years; five years at the business. C. J. Hinman, Bainbridge, N. Y. Mar. 10

By a young man with nine years' experience in hardware business, both on road and in house; moderate salary; best of references as to character and business capacity. "Cutlery," Box 106, Canton, Miss. Mar. 10

With some good, reliable firm as TINNER; can do anything around a tin shop; temperate man; can give references. W. L. Mallory, 106 Orchard Court, Akron, Ohio. Mar. 10

By a TINSMITH; experienced at pump work and general jobbing; can act as salesman; furnish a set of tools. "Leack," Box 72, Springfield, Vt. Mar. 10

By a MECHANICAL DRAFTSMAN who thoroughly understands heating and ventilating in all its branches; strictly temperate and reliable. J. P. Lisk, 636 Meserole street, Brooklyn, N. Y. Mar. 10

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 17, 1894.

DAVID WILLIAMS, - PUBLISHER

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CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

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The 36-Box Rule in Wales.

The action of the Welsh tin platers' union in clamorously insisting on the strict enforcement of the "36-box rule" in all the tin plate works appears to be a most injudicious move at the present time, when so many works are idle and so much distress prevails among the workmen in this industry. The only outcome of the agitation, so far, has been the closing of further mills, whose owners either object to being dictated to by the union officers, or who cannot afford to restrict their product. Several owners of tin plate works have lately furnished them with improved machinery for the express purpose of increasing their output, and it is only by getting the utmost use out of these improvements that they can hope to reap any profit at all in the present condition of the tin plate market. If the Welsh tin platers wish to play into the hands of American manufacturers they could not adopt a more effective course for hampering and damaging their own trade. The movement of the tin plater's union is certainly ill-timed, and is far from likely to benefit the workmen for whose behalf the union is ostensibly acting. Where manufacturers can make a reasonable profit from an output of 40 or 45 boxes a day per mill —easily obtained with the present improved machinery—but cannot do so if the output is to be restricted to 36 boxes, it is not likely that such a rule will be adopted. It is cheaper to shut down and wait for better times. In this case the workmen are the greatest sufferers.

The Building Outlook.

One of the most cheerful prospects in the trade situation is in the direction of building operations. Seldom has the future looked brighter for those in the building trades than at this time. There were indications of this some time since, when architects' offices were reported to be again filling up with work. But what was then to some extent a matter of mere promise now seems actually nearing fulfillment. Building permits are being taken out in large numbers in the leading cities, and contracts are getting into the hands of builders. In the city of Chicago the records for the month of February show building permits granted for almost as great a frontage and nearly as high a total value as in February of last year. This is particularly significant from the fact that in the spring of 1893 building was very active in that city among those who were making preparations for the World's Fair. Few cities at that time were as busy in the building line as Chicago. If preparations for building there are now on a scale but little below that of last year, it augurs well for a very important branch of trade on which many other branches depend.

Moderation in Building.

The character of the permits now being taken out in the cities shows quite a change. Fewer great structures are in prospect, but the great bulk of the buildings projected are houses of moderate size, good store buildings and a sprinkling of warehouses and factories. Builders will consequently be more generally employed by the greater number of separate contracts, and the ordinary mechanic is likely to find employment of a more steady character than when great structures are being rushed to completion as speedily as possible. There has probably not been so favorable a season for making improvements of this character for 20 years. All kinds of materials are lower than ever before known in this country. Builders are anxious to obtain work, and, generally speaking, workingmen are even more anxious to get to work because many of them have had nothing to do for a long time and have either exhausted their resources or soon will do so if they do not speedily find employment.

Heating Surface of Boilers.

If anything in steam engineering may be said to have been positively determined, it is the fact that the same extent of heating surface in different types of boilers does not have the same efficiency; and that the relation of grate area to heating surface ought to vary, not directly as the extent of the heating surface, but directly as the total efficiency of the surface. A boiler whose heating surface of, say, 100 square feet has a maximum evaporative power of 300 pounds of water per hour wants no more grate than another one having a surface of 75 or 80 feet so placed that its total evaporative capacity is the same as that of the first. Every square foot of grate more than enough to supply heat for the maximum evaporative capacity of a boiler is a square foot of error in its construction in the direction of fuel waste. It is true that convenience in the use of heating boilers demands that their grates shall carry a sufficient amount of fuel to obviate the necessity of too frequent supply. Such capacity, however, should be obtained by ample depth of fire box rather than by excessive area of grates.

New Boiler Designs.

The birth rate of new heating boilers in this country is, at present, about one a week. An examination of the new comers, as well as many that are not new, shows that in many of them no provision has been made for the adjustment of the grate area to the evaporative efficiency of the surface transferring the heat generated to the contained water. It is likely that tests of a large number of them would show in some a deficiency and in others an excess of grate as compared with evaporative capacity of heating surface. In most boilers designed purely for heating work, the heating surface is of such complicated form—that is to say, has such peculiar shapes and positions in its various parts—that any attempt to calculate evaporative capacity in advance of trial will nearly always fail. The only reliable determination in such cases is through actual test; and if this can not be done with different great areas, how can it be ascertained whether a boiler has worked in the test up to its maximum of both efficiency and fuel economy? Is economy an unimportant consideration in a heating boiler? If it be so regarded by any designer of new boilers he will find, in competing with established manufacturers, that he is making no longer a square foot of error, but a square acre of indiscretion.

A comparative summary of the exports and imports of merchandise during the seven months ending January 31, 1893 and 1894, recently published, shows that imports into the United States fell off during the latter half of last year to the extent of $112,822,621, as compared with the period ending January 31, 1893, while exports increased by $41,264,227. The figures are:

Imports.

Seven months ending January 31, 1893	$484,371,681
Seven months ending January 31, 1894	371,549,060

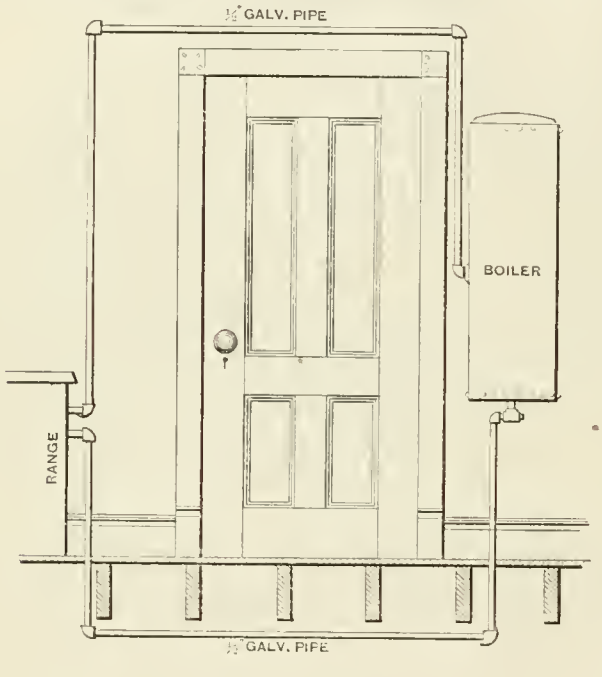
Exports.

Seven months ending January 31, 1893	$519,031,818
Seven months ending January 31, 1 94	560,295,54

THE LETTER BOX.

Small Air Bound Pipes.

From E. J. S., *Ramapo, N. Y.*—In *The Metal Worker* of February 10 I noticed the letter and answer headed "What Caused the Collapse?" and found it very interesting, and as I experienced the rumbling noise described as having preceded the collapse of the copper range boiler I will lay my case before your readers also with an illustration of it. My tank is 10 feet higher than the boiler, but the rumbling noise is at times very disagreeable and can



Small Air Bound Pipes.

be heard all over the house, sounding like the noise produced by turning steam under heavy pressure in a vessel of water, as is done in manufacturing establishments for heating water. I have observed that with a very hot fire in the range the noise in the boiler is louder and continues longer than at other times. It generally occurs when water is being drawn from a faucet somewhere in the house, and it makes no difference whether hot or cold water is being drawn. Sometimes, however, it will occur when the fire is quite low and no water is being drawn. The noise almost always is produced by feeding water into the heater in the cellar, which is connected to the same pipe that supplies the boiler. I will describe the system of piping, and will invite your readers to criticise. I am in hope that a solution of the problem will be found by altering the pipe system. I will say beforehand in explanation that owing to the fact that there is no plumber near by I superintended and directed the piping myself, and therefore the system may be quite objectionable in the eyes of the practical plumber. The boiler is of 40 gallons capacity, stands about 5 feet from the range, and the pipe which supplies it drops from tank on second floor to the cellar, and from thence rises up through the floor to the top of the boiler and extends down to near the bottom, as shown. The pipe from the boiler to the water back drops down to the floor and across to the range, where it rises up through the floor and connects to the lower connection of the water back. The pipe from the water back returning the hot water to the boiler rises from the water back up to a hight a few inches above the top of the boiler and then crosses over and drops down into the proper connection in the side of the boiler. The peculiar method of piping this return to the boiler was necessitated by having to run it high enough so that a closet door would swing under it. All the pipe is ½ inch galvanized iron, measuring about ⅝ inch inside. The illustration shows the arrangement with the exception of the supply pipes and hot water service pipe.

Note.—We hope our readers will accept the invitation to give their views in this case. In the meantime, we would suggest that the use of larger pipe would give a freer and smoother circulation. The small pipe does not allow the water to circulate with sufficient rapidity to prevent it becoming overheated in the water back; consequently steam is generated and causes the noise mentioned. The pipe running over the closet door, dropping down to the boiler, is another cause for the noise. If steam is condensed in the pipe it would naturally jar all the pipe in the system, and the rush of water in filling the vacuum produced would also make a shock and noise. We would suggest as a remedy that the boiler be raised up, so that the pipe will run directly into the side opening without any dropping down. If this is not possible, the side opening could be plugged and an opening made in the boiler higher up, or if this is impracticable, the return pipe from the water back can be connected with the hot water service pipe at the top of the boiler. The rise in the pipe as it passes across the top of the door having no vent permits the collection of air, which would impede the circulation. The slight pressure in the system, from the tank being so little above the boiler, facilitates the generation of steam, and when water is drawn at any of the faucets in the house the pressure is further reduced, which for the time being aids the generation of steam and increases the noise. Where the pressure is slight it is always well to have larger pipes to and from the water back, even to 1 inch in capacity, to provide for a free circulation, so that no water will remain in the water back for a sufficient time to be heated to the boiling point. The ell at the water back must necessarily be a reducing ell from 1 to ½ inch, and by changing the return pipe to the boiler to 1 inch in size in all probability the trouble reported will be very much relieved, if not remedied.

Work and Wages.

From H., *Michigan.*—In your issue of February 24 I see a letter from "Right Hand," referring to left hand tinners. I once worked with one and I could not see any difference between his work and a right hand man of the same ability. To me it seems an absurd idea that a left hand man cannot make as good a mechanic as the man who some would term his more fortunate brother, because he has been born with strength and handicraft predominating in his right arm. When I used to be putting up more gutter than falls to my lot of late years I never considered it a smart trick to either solder or hammer with my left hand, if I was in a tight place on a ladder or elsewhere. But to make the subject more interesting, let me state what I find a greater drawback than left handed men. It is the impractical and uneducated men who pose as mechanics, and a great many employers are more to blame than the men. Why? Because the employer looks too often at the wage per day he is paying, but does not follow it up with a close examination of the amount of work he is getting for said wages. To illustrate: Last fall a man was engaged to help on some contract work. He was placed on the same building as another man, a steady hand, who worked steady but not hard. When the day was done the new man had done, with no exaggeration, twice as much work as the old one. The old hand had spent a big

part of the time looking round, talking, &c. When pay night came the new hand wanted 25 cents per hour. He was paid, but could not be kept on, as the price was too high. The old hand got 20 cents per hour. Which was the cheapest man? It does not need a mathematician to answer that question. But please answer the following: What are we going to profit by spending time and money educating ourselves and becoming proficient in the trade (by proficient I mean a man who can estimate for and perform a work anywhere from a cornice or furnace job down to a tin cup), when an inferior man may command as good wages, with few exceptions? I have also worked in shops where the foreman would have very little use for a man who would not take a certain degree of interest in unloading beer schooners.

This is a subject I could write more largely upon if space would permit, but would like to see the matter agitated and hear from a number of *Metal Worker* readers.

Left Handed Tinners.

From J. Van P., *Sac City, Iowa.*—In *The Metal Worker* of February 24 I notice a communication signed "Right Hand" of Pennsylvania, in which he gives his experience (which has not been large) and invites readers of the Letter Box to do the same in regard to left handed tinners. As I am one of the (in his estimation) unfortunate ones under consideration, I will very cheerfully give my experience, which extends over a good many years and a good deal of tinners' work in New York, my native, and in Iowa, my adopted State. In all that varied experience in both States the fact of my being a left handed man has never been any disadvantage, but, on the contrary, has often been a convenience when working on awkward shaped tin roofs and soldering around corners. I think "Right Hand" must not be as observing as the school children of his town or he would not have suggested left handed tools, for what shape could the handle of soldering copper, hammer and mallet be to accommodate a left hand? And did he ever observe that all the stakes are straight handled and couldn't very well be any other shape, and how would squaring shears be arranged to be convenient to left hands? And the bench shears. I would call his attention to the fact that they are exactly like left handed snips, are they not? I mean in their manner of cutting. And still another fact has no doubt escaped his observation. I would ask which hand of a right handed man does the most in working the machines in tin shops turned with a crank. Is it not the left hand? The right one merely turns the crank. A left handed fire pot would be as sensible to suggest as any other tool that tinners use.

From W. C. H., *East Haddam, Conn.*—Referring to recent articles in *The Metal Worker* on "Left Handed Tinners," it fell to my lot to learn the trade from a left handed man. My father being a tinner used to take me with him as soon as I was large enough to be of any use to him, and for 15 years I have been steadily in business with him. I have never noticed that my father's left hand was any detriment to him. He even claims that he can do work that a right handed man cannot, being able to use both hands in tight places. I do not have much sympathy with your correspondent in *The Metal Worker* of March 3, who was sorry for his bargain with the left handed boy, as his own experience taught him evidently that lefthandedness is not necessarily a mark of inefficiency. The trouble with the fellow who could not "pipe the house" must have been in his head, as that story hardly seems compatible with ordinary intelligence, supposing him to have been in the shop for any length of time. I do not remember having suffered any inconvenience in receiving instruction from my father on account of his left hand, except to reverse the order of holding a tool at work, which readily adapted itself to my intuition. We have but one left handed tool in the shop, which is a pair of snips and which for convenience I would rather use than a right hand pair. My advice would be to give the left handed boys all the chance possible, and if they will attend to business, form habits of industry and virtue, they will come out far ahead of many others whose right elbows are too often on a level with their chins.

From W. F. A., *Toledo, Ohio.*—I have been somewhat amused at the letters from the boys in regard to left handed tinners, and I think "E. W." of Pulaski, whose letter appears in *The Metal Worker* of March 10, is right, and he comes close to my case. I have worked at the trade since 1856 and could and have used all of the tools that a right handed man did, but am now lacking a left handed monkey wrench.

Better Marked Stove Repairs.

From J. H. W., *Williamsport, Pa.*—The appeal of "J. F. T." in *The Metal Worker* of February 10 contains a good suggestion, that of the manufacturers pasting a label on the stove repairs with the name and number of the stove for which it is made, and I hope it will be followed, but I have grave doubts whether the manufacturers and jobbers will put themselves to the trouble. I do quite a stove repair business, and give my system of handling it. There are many other ways, such as having tags printed with the dealer's name and the names of the different parts of a stove, a vacant line for the customer's name, to be sent with the orders to the manufacturers that they may be fastened to the proper pieces. But all this costs money, and the dealers do not have time to do it. When a customer orders repairs for a stove or furnace from us we ascertain whether we have the repairs in stock, and if not we have a special blotter on which we put down the date, the customer's name and address and the several parts of repairs which he desires, and all the information in reference to the stove, with number, &c., that is necessary. Then we leave several lines of free space and make a memorandum, when the order is to be filled by freight or express, whether we are to deliver it and put it in place, and other remarks that are necessary. When we send the order to the jobber we add below each order the name of the customer, and request these repairs to be tied in separate bundles. When the repairs arrive with a small tag fastened on each package with the customer's name, we take our repair book and check off the goods received. We can tell at once by the small tags on the repairs for whom they were ordered and for what stove, and if the goods are not called for early, we can write the customer to drop in and get them; and if they are never called for, we write on the back of the tags the name and number of the stove to which they belong. We also keep a small ledger for stove repairs, from which we can tell at once what we have in stock. On the margin of the stove repair book we put down the name of the house to whom we have sent the order. I have found this a very convenient way of keeping track of repairs, but if any of the readers of *The Metal Worker* have a better way I should be pleased to learn of it.

Tin Cabinet for Coins.

From Fred M. Parks *Washington, Warren County, N. J.*—I am a reader of *The Metal Worker*, who tries to keep up in his business of an all 'round tinner. As a sort of relaxation I devote a little of my time to making a collection of coins, and will consider it a favor if some of your readers will suggest something in the way of a cabinet to keep them in. I want something that can be made of tin. I would also like to add if any brother tinner has an old or odd coin of any kind, I should like to hear from him and correspond with a view to purchasing it.

Furnace Gas Burner.

From I. W., *Philadelphia.*—Can *The Metal Worker* or any of its readers tell me where I can purchase a gas burner suitable to be used in a hot air furnace? The proposed change in the price of gas in our city has already made some inquiry for apparatus to use gas instead of coal for heating and by this means get rid of the labor and dirt attending the use of coal and disposition of the ashes made. Some of the readers of *The Metal Worker* in the natural gas district no doubt are using such a burner, either in hot air furnaces or steam and hot water heating apparatus, and I shall be glad to have them let me know what they use and some idea of the trouble experienced in their use and what is necessary to secure successful operation. I know that the pressure in our city mains will be nothing like as great as the pressure secured from natural gas mains, but think I can overcome this trouble by an adjustment of the burner.

Retinning Rusty Tinware.

From A. M. C., *Brooklyn, N. Y.*—Will some of the readers of *The Metal Worker* please give me a recipe for the acids used in retinning rusty tinware, and a description of the operation it should be put through?

Note.—We should be pleased to have the readers of *The Metal Worker* give our correspondent such information on the subject as they may possess. It is a question if tinware that has once become rusty can be retinned so as to produce satisfactory results. This would especially be the case with articles that were joined by soldering. We are informed that the rust can be removed from the tinware by placing the articles in a bath of dilute nitro-muriatic acid, the strength of which and the length of time the articles were to remain in the bath depending upon the depth of the rust. After being cleaned, the articles are to be dipped in clear water, when they are ready for retinning. A description of the process of retinning was published in *The Metal Worker*, August 22, 1891, page 42.

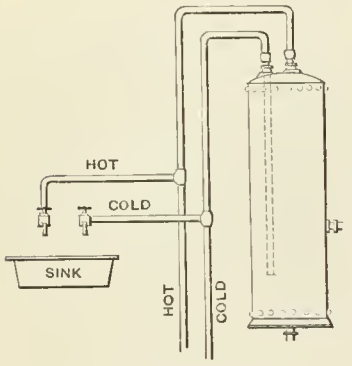
Finishing Lead Castings.

From H. L. C., *Chicago, Ill.*—Will you inform me through the columns of *The Metal Worker* how to coat hard lead castings in large quantities, so that they will have the appearance of tin or an alloy of tin and copper? I want to improve the appearance of the castings.

Answer.—We know of no better plan than to immerse them in melted tin and give a tin coating. This can be easily done by first dipping the hot castings in melted tallow and then passing them through a bath of tin. If our correspondent wants some simpler and more inexpensive method perhaps some of our readers may suggest a plan.

Hot Water From Cold Faucet.

From L. J. P., *Peru, Ind.*—Will some one inform me through *The Metal Worker* what causes hot water to come from the cold water faucet over the



Hot Water from Cold Faucet.

sink in the system of plumbing shown in the illustration and a remedy for it? The boiler is thoroughly clean, yet the flow was very weak until, by vigorous back pumping, it was increased.

School House Ventilation.

From H. SANDMEYER & Co., *Peoria, Ill.*—The importance of ventilation in our schoolrooms is at last beginning to attract the attention of thinking men all over the country. In the past month the National Association of School Superintendents held their annual convention in Richmond, Va. In discussing the proper systems of teaching they all agreed that the first requisite in a schoolroom is fresh air. They passed the following resolution:

Resolved, That each State should by law provide for the proper ventilation, lighting and heating of each school, and that there should be at least 1500 cubic feet per hour of fresh air provided for each pupil.

This is a step in the right direction. It is a crime against the coming generation to confine little children in air tight boxes, compelled to breathe impure air laden with the germs of disease, thus laying the foundation of pulmonary complaints in years to come. It has been demonstrated that fresh air can be provided in sufficient quantities to more than comply with this resolution without the aid of fans, gas or any machinery whatever.

The Greeley School of Peoria, Ill., is a 12 room building, constructed in such a way as to ventilate each room thoroughly. It is all done by means of flues, so arranged as to bring in this amount of fresh air and carry it out when vitiated. If one architect can do this every architect can. There should be a law in every State to make it obligatory upon school boards to see that this is done. They ought not to be content with any half measure, and certainly experience shows that it is no longer necessary to resort to guess work. It can be done with mathematical certainty.

The Metric System.

From A. O. S.—Please explain to me the system of weights and measures known as the metric system, to which I have recently seen reference made. What are the equivalents of the metric units in the common system?

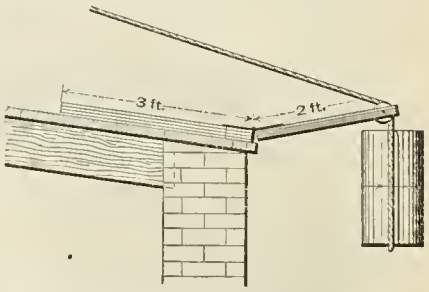
Answer. — Our correspondent has asked too comprehensive a question to be answered in full. We can, however, give him the principal units, so that he can understand the difference between the two systems. The base of the metric system is the meter, which is approximately 39 37 inches in length. The decimeter, centimeter and millimeter are $\frac{1}{10}$, $\frac{1}{100}$ and $\frac{1}{1000}$ of the meter in length. There are also other measures greater than the meter made by multiplying it by 10, 100 and 1000. The base of square measure is the square meter, equivalent to 1550.03 square inches. The square meter is also divided as well as multiplied by 10, 100, &c. The cube of these measures gives the cubic or solid measure. The common unit for liquids is the liter or cubic decimeter, which is equivalent to 1.056 quarts. The basis of the weight measurements is the weight of a cubic centimeter of distilled water, which is called a gram, equivalent to 15.432 grains. The measurement commonly used is the kilogram, equal to 2.2 pounds.

Fails to Bake on the Bottom

From J. F. L., *Baltimore, Md.*—If too much has not already been said in answer to "F. W.," Guelph, Ont., whose inquiry appeared in *The Metal Worker*, January 20, the following experience may be of interest to him. I take it that the vertical flue strip down the back of the stove or range, and also the horizontal one between the bottom oven plate and the bottom of the stove, are in relation to the stove or range as is a needle to the sewing machine, and all stoves or ranges to bake must have this plate. Now, assuming that the pipe is of the proper size, and the chimney has all the surplus openings closed and is one of fair draft, and the pipe is not pushed too far in the chimney or the neck of an elbow, then the stove should do good work. The coal being well ignited and the damper closed, if the coal is hard or too large, trouble will result surely, unless there is a very powerful draft, particularly if No. 2 Sunbury coal is used; for when the damper is closed the flame is dead a short distance from the fire box, and consequently there is but little heat to circulate around the oven and heat it. If coal of the same grade is used that is known as No. 3 Lykens Valley, the flame will extend more than half way across the top of the oven and throw a volume of heat under the oven, which can be further increased by the use of wood. This will further support my argument—which is, that a strong draft is required, and cooks often say that they get along much faster with pastry when wood is used. I have had many cases of stoves that failed to bake, and I conquered every one by providing a free draft.

Roofers' Elevator.

From L. M. W., *Delaware.*—Here is an illustration and description of a roofers' elevator that I have used with satisfaction in the absence of something better for hoisting rolls of tin to a roof



Roofers' Elevator.

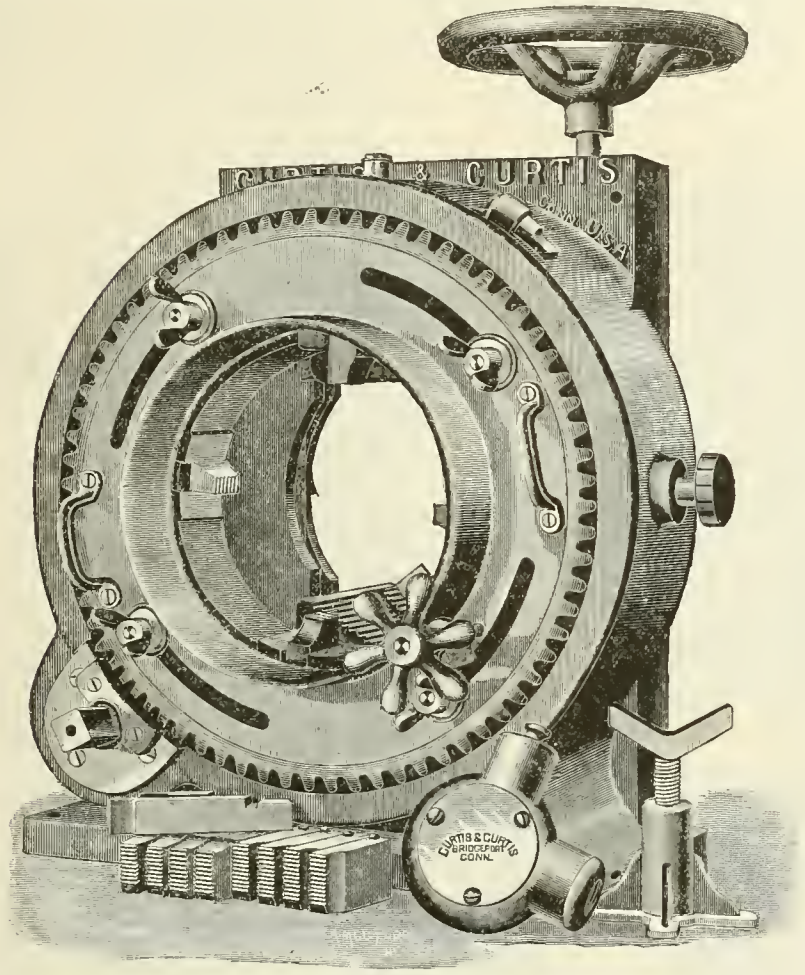
instead of carrying them up a ladder. It should be made of oak, 1½ inches thick and 6 inches wide, one part 3 feet long and the other part 2 feet long. Buy a 14 inch extra heavy strap hinge, a pulley wheel 4 inches in diameter with a ½-inch hole in it, and a ½ inch bolt, 6½ inches long. In the short piece of oak at one end saw a slot in the middle of the 6-inch side, 6 inches long and wide enough for the pulley wheel to turn easily. Bore a hole for the bolt to hold the pulley wheel and secure them in place. Fasten the two parts together with the strap hinge and it is ready for use. A strap made of band iron with holes in each end for screws or nails to hold it on the roof should also be provided when a considerable quantity of tin is to be raised. Standing on the long part will answer for raising a few rolls. In use, all of the short part hangs beyond the edge of the roof and a rope runs over the wheel to the ground, with a hook on the end for fastening to the roll of tin. By pulling on the rope on the roof it works easily over the pulley, raising the tin until the roll strikes the short part of the elevator, when an up pull will make the hinge double back and drop the tin on the roof.

Flat Seam Roofing Question.

From F. B K., *Delaware, Ohio.*—I notice in *The Metal Worker* of February 10 what "G. R. J." says about roofing. There is too much work done without knowing what it costs to do it, and a good many tinners reckon their cost by guess. A painter here tells the following story, which illustrates the way some tinners do their figuring. The painter figured on painting a house and filled a sheet of paper about 3 feet square with his calculations, and then, as there was no more room, said: "A cipher is a cipher, and 5 into twice you can't. Begob! I'll paint your roof for $50." If any of your readers have blanks for their men to fill out in getting at the cost of doing roofing I would like to hear from them; also examples of estimate blanks.

The Forbes Die Stock.

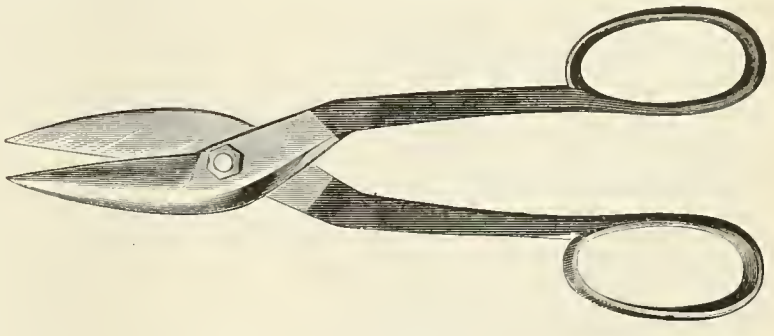
Curtis & Curtis of Bridgeport, Conn., have recently brought out a new development of the Forbes patent die stock. The cut shows a front view of a machine called, for purposes of identification, a No. 3 C hand machine, and it both cuts off and threads all sizes of wrought iron pipe from 2½ to 6 inches. As this machine weighs only 325 pounds it is easily portable from place to place and the work done on the spot, without the trouble and expense of carting the pipe to the shop and cutting it to measurement. In operating this machine the pipe to be cut is placed in the machine from the rear through the self centering vise, which clamps it and brings it central with the dies. The face plate is then turned to the proper graduation for the size of pipe to be cut, which sets the dies at standard size. Any variation of the fitting can here be allowed for, and the pipe cut either over or under standard size, if desired. The reversible ratchet wrench shown in the cut is then placed on the end of the pinion with a piece of pipe in it for a handle, and either by revolving it round like a crank or by ratcheting it like a pump handle the die carrying gear is caused to revolve. On the back of this gear is located a lead screw which causes the gear, as it revolves, to also recede into the shell and the dies are brought on to the pipe. When the thread is cut, instead of being obliged to revolve the gear back again to its original position, as was necessary with the old style of machines made by this firm, a turn of the knob, shown on the side of the machine, releases the lead screw, the dies are thrown back, the gear is pulled forward and all is ready for new work.



The Forbes Die Stock.

The Lyon Shear.

The accompanying cut represents a shear which Lyon, Conklin & Co. of Baltimore, Md., are putting on the market. The blades of the shear have outer faces of rounding shape, while the upper edges of the inner faces are also slightly rounded. The steel of the blades extends beyond the bolt, and the bolt thus passing through steel tends to prevent the loosening of the shear. The shear is described as being especially adapted to cornice and tin work, being so constructed as to allow of the cutting of scrolls, circles and other intricate work not within the scope of the ordinary shear. It is made for both right and left hand use.



The Lyon Shear.

A Mammoth Bottle.

Considerable attention was attracted March 9 by the exhibition of a mammoth bottle in front of the hardware, stove, plumbing and tinning establishment of M. Abbott's Sons at 137 Eighth avenue, New York. The bottle was made for the Emerson Drug Company, and is an exact *fac simile* of the bottle in which one of their specialties is sent out. It is to be used for advertising purposes here and finally sent to London for use there. The bottle is a piece of the handicraft of Patrick Keogh, the foreman of the sheet iron shop, and the raising work on the breast between the body and the neck of the bottle reflects credit to his skill. The bottle is made of No. 22 galvanized sheet iron and stands 9 feet high and is 3 feet 6 inches in diameter for a hight of 5 feet, when the breast gradually forms with a curve or swell into the neck, which is 2 feet 6 inches in diameter. The neck runs straight for 12 inches, when the mouth of the bottle flares to a diameter of 2 feet 4 inches and runs up 6 inches and is finished by a representation of a cork, which completes the hight. The bottle is so made that all the seams and joints are perfectly smooth on the outside, being soldered and then filed. On the inside a band covers all the seams and is thoroughly soaked with solder. A door is arranged near the bottom so that the bottle can be used for the storage of advertising matter and to enable a workman to get inside to straighten out any deformity that might be caused in transportation. The bottom of the bottle is made of 2-inch wooden plank to allow it to be bolted to a wagon for showing through the streets. The total weight of this pride of the sheet iron worker is 140 pounds, and he laments that it will cease to attract attention as a credit to his art when the painter transforms it into a giant representation of a bottle and label.

It is stated that the new shipbuilding programme of the British Government will consist of the construction of eight first class battle ships of the type of the "Majestic," at a total cost of $33,600,000.

Last week's real estate transactions in New York City materially exceeded in number and importance the dealings for the corresponding week of 1893, which was considered a very satisfactory one. Real estate men generally entertain hopeful views in regard to spring business. There is just now plenty of money seeking profitable investment, and there are indications that a considerable amount of it may flow in this channel.

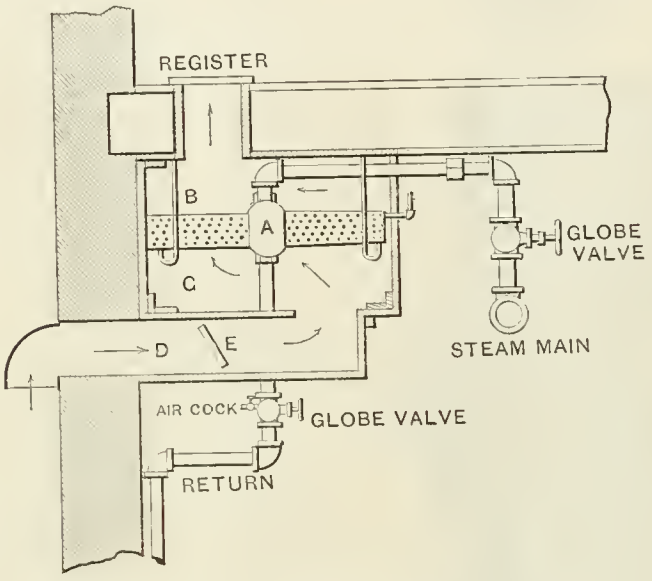
STEAM AND HOT WATER.

Indirect Radiation.

BY HELIOS.

In placing indirect radiation of any make a space of not less than 12 inches must be left above the radiators for a hot air chamber, and a space of 12 inches below the radiators for a cold air mixing chamber. If they are to be inclosed in wood or galvanized iron boxes, they will have to be supported with wrought iron hangers and supporting bars. If they are to be built in with brick work, the supporting bars can be built into the brick work. They must have a grade from the steam inlet section to the return outlet section, so that all condensation can drip out and leave no water in them to freeze, if the steam is down or the radiator is shut off. The steam supply must be taken in on top of the first section, and the return from the bottom of the last section. Globe valves must be placed in the steam and return pipes. Drill and tap a hole in the return valve back of the seat and put in a ⅛-inch air cock; this cock is to let out all water in the return pipe above the valve when the radiator is shut off. Place in the last section an automatic air valve.

The area of the cold air box should be not less than 1 square inch for each foot of heating surface in the radiation; the hot air pipe should have 1½ square inches area for first floor and 1 square inch area for second or third floors to 1 square foot of radiation. All registers must have openings full size of the hot air pipes. Always place the registers in the floor if possible, as the radiation will do very much more and better work than if they are placed in the side walls. If the registers are placed in the side walls it will take 20 per cent. more radiation to do the work than if they are placed in the floor. In placing the casing around the radiation great care must be taken to have the casing fit close to the radiation, so that no air can pass without going through the space between the radiation. Always connect the hot air pipe from the opposite end of the box from the cold air inlet.



Indirect Radiation.—Fig. 1.—Cross Section of Radiator, Casing and Pipe Connection.

The following illustrations will show the manner of connecting indirect radiation. All rooms that are warmed by indirect radiation must have ventilation of some kind to remove from the room as much air as is delivered into it. Without ventilation the indirect heating will be a failure. In placing all hot or cold air pipe, do not have any square turns; run the pipe as straight as possible; the cold air pipe can be taken from any cellar window and can be built of wood, tin or galvanized iron; galvanized iron is the best, as it can be made air tight and will take up less room than wood boxes.

Fig. 1 shows a cross section of indirect radiator casing and pipe connections. A is the indirect radiators. B, the hot air chamber. C, the cold air chamber. D, the cold air supply pipe. E, damper in cold air pipe to regulate the cold air supply to the radiators. Fig. 1 shows the register placed in the floor over the radiator. The cold air is taken through the side wall and connected to the casing of the radiation. Always place a damper in all cold air boxes, as shown at E. Fig. 1 shows the radiation inclosed in a wood stack box. The box is made of dry white pine beaded ceiling, not over 3 inches wide, for the sides and bottom; the top on the inside can be made of good quality matched flooring. The sides are secured to battens on the inside with screws and the sides and bottom are all put together with screws, so that the sides or bottom can be taken down at any time. The ceiling over the radiators and the sides down to the under side of the radiators must be covered with bright tin, put on smooth and secured to the wood work with tacks. The hot air pipe from B to register can be made of wood lined with tin or it can be a square tin pipe. Connect the steam and return pipes as shown in Fig. 1.

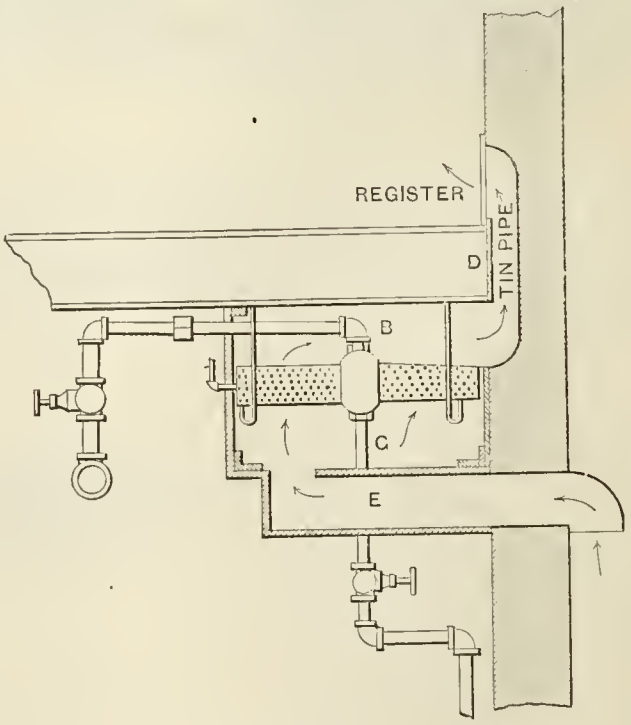


Fig. 2.—Indirect Radiator and Connections with Side Wall Register.

Fig. 2 shows a cross section of indirect radiation, same as illustrated in Fig. 1, with the hot air register in the side wall. The hot air pipe D, Fig. 2,

can be made of tin or galvanized iron. Always have a round top register box, and if the hot air pipe has to go in an outside wall cover it with two thicknesses of asbestos paper $\frac{1}{16}$ inch thick. Do not place hot air pipes in outside wall if it is possible to place them in the inside partition walls.

The Gurney Steam Boiler.

The Gurney Hot Water Heater Company, Boston, Mass., show commendable enterprise this season in putting on the market a steam boiler, views of which are presented in the accompanying illustrations. The company have been earnest advocates of water as a heating medium, and explain that they now come out with a full line of steam heating goods because their competitors who were formerly makers of hot water heaters alone, through consolidation of interests, forced them to meet concerns controlling both steam and water apparatus. In the accompanying illustrations Fig. 1 is a general view of the boiler and Fig. 2 shows it separate, revealing the internal construction and the distribution of the water surface. The boilers are direct surface burning, special claims being made for the arrangement of surface, which is staggered so that the heat of the gases is thoroughly extracted. Special mention is also made of the quickness of the boiler. Attention has been given to securing a steady water line, and the company claim that the means used are ample to secure this desirable result. Ample provisions have also been made for removing ashes from the ash pit and surfaces. A valuable feature to which particular attention is directed and in which the trade will be interested is that it is shipped in only three pieces. The body of the boiler is in two pieces and there are no water or steam joints requiring packing, the joints being in every instance screw joints, or iron to iron. The form of the waterways and distribution of surface is so clearly indicated in Fig. 2 that no further description is necessary. Special claims are made for the simplicity of the boiler, and the company say that in setting it up it is desirable to cover it with asbestos or mineral wool. The boiler, we understand, has been thoroughly tested, the company having employed an expert to determine its standing. They secured the services of W. J. Baldwin, M.E., of New York, who is well known to the trade and who furnishes the following report of his test: "The performance of the boiler during the trial was admirable, being steady and reliable, so that the steam did not vary ½ pound in pressure at the times of firing." Mr. Baldwin further states: "I never tested a boiler that gave as high an efficiency of evaporation per square foot of boiler surface."

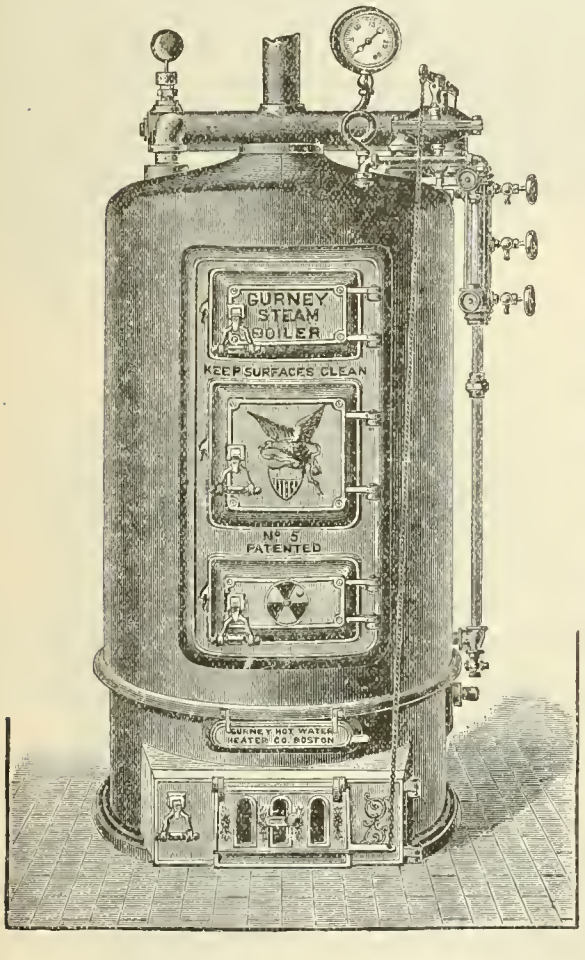


Fig. 1.—General View of Boiler.

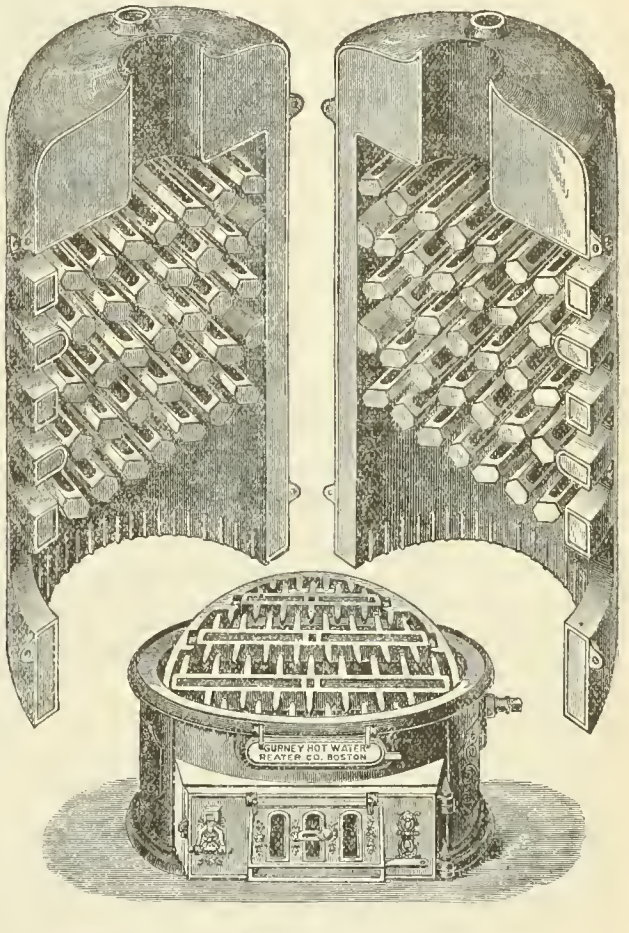


Fig. 2.—Boiler Separated Into Three Sections.

THE GURNEY STEAM BOILER.

HEATING NOTES.

The Greensburg and McKeesport business of the Pittsburgh Heating Supply Company has been purchased by H. Clymer Painter and S. J. Sloan. The new firm will be known as Painter & Sloan in Greensburg, Pa., and Sloan & Painter at McKeesport, Pa. They will do any kind of painting and tinning work during the coming year.

The calendar for the month of March sent out by M. Mahony, Troy, N. Y., is a very pretty reminder of the Mahony boilers. The calendar is a single card, with the days of the month in a panel at the bottom, while the chief feature of the decoration is the effect of the March wind on a young lady and her umbrella.

The latest postal traveler of the United States Heater Company, Detroit, Mich., calls the attention of the trade to the Mascot hot water heater, which is a small apparatus that has been put on the market by the United States Heater Company. It is intended for warming small residences, flats, conservatories, greenhouses, &c.; also for heating water for barber shops, baths, laundries, baptisteries, hotels, &c. The firm will soon have a steam heater out of the same general pattern.

The All Right and Volunteer boilers are the subject of a scarlet pamphlet issued by the manufacturers, the William H. Page Boiler Company, Norwich, Conn. These boilers are so well known that there is no need here of referring to their particular features. The All Right is a brick set boiler made in four sizes and the Volunteer a portable boiler made in seven sizes. In addition to the full description and illustrations of the boilers, themselves, other pictures are given

of some of the work done by the William H. Page Boiler Company. Two illustrations show the exterior appearance and interior of All Saints' Episcopal Church in Brooklyn, together with a diagram of the arrangement of surface. At the close are other cuts of residences, with a number of testimonial letters.

A HANDSOME red bound catalogue and price-list of Richmond heaters for steam and hot water is distributed by Albert A. Cryer & Co., 85 Center street, New York. The circular also calls attention to the Rex hot water heaters and hot water laundry stoves. The pamphlet of 23 pages contains numerous illustrations, full descriptions, tables of prices and sizes and some account of radiators.

THE SHERWOOD MFG. COMPANY, Buffalo, N. Y., issue a card directing attention to the Sherwood Injector, and also giving a list of a number of steam specialties that they manufacture.

THE MASON REGULATOR COMPANY, 10 Central street, Boston, Mass., are distributing an advertising novelty in the shape of a box of dominoes, with which the members of the trade can amuse themselves during leisure hours. The dominoes are made of hard wood, varnished on the side bearing the sunken spots, which, with the border and division mark, are in red. As the dominoes are issued primarily for advertising purposes, it is natural to find in connection with them some reference to the company and their specialties. Upon examining each domino there is found on its back a few lines indicating that the Mason regulators are adapted for steam, water and air, and also that the company make the Mason boiler feed pump. We understand that a set of these dominoes will be sent to any address on receipt of 12 cents to pay the cost of postage and packing.

RUBEL & Co., manufacturers of the Lily line of ranges, furnaces, steam and hot water heaters, 114-116 Lake street, Chicago, will move, May 1, to 75 77 Lake street.

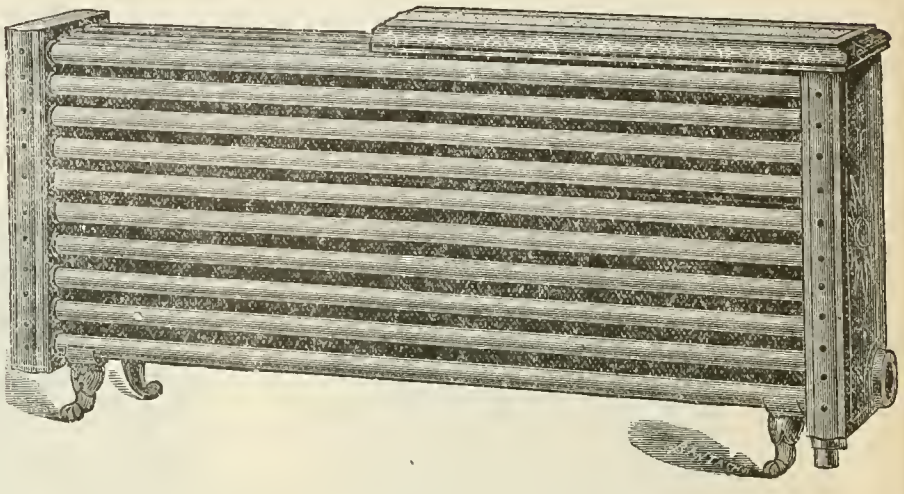
THE FULLER & WARREN COMPANY, Troy, N. Y., have closed a contract with F. O. Singer & Co., Baltimore, Md., for the exclusive agency of F. & W. Co.'s boilers, combination heaters, &c. F. O. Singer & Co. make a specialty of fine plumbing and hot water heating. They have been making some extensive improvements in their warerooms, having just fitted up two handsome offices in quartered oak and cut glass and repainted the interior to harmonize with the oak finish. The warerooms and offices will be heated with hot water from a F. & W. Co.'s boiler.

THE BABCOCK & WILCOX COMPANY are sending out a circular from their new office at 29 Cortlandt street, New York, directly opposite their old office, announcing their removal. It is a four-page sheet, containing half-tone engravings of their various offices in the different cities of the United States and at Havana, Cuba. It also has an engraving of a Babcock & Wilcox boiler with the statement that there are 1,500,000 in use and that they are manufactured in the United States, Scotland, Germany, Austria and France.

The lumber firms of Minneapolis have decided to consolidate, and, it is stated, have consummated a large deal of pine timber on the Upper Mississippi, comprising some 1,500,000,000 feet of timber.

The Windsor Hot Water Radiator.

We show in the accompanying illustrations elevation and sectional plan views of the Windsor hot water radiator made by the Windsor Heator Company, Galena, Ill. These radiators are made of ½-inch pipe, which subdivision of water, it is claimed, gives great efficiency to the radiator. They are also very light, and take up little space. Their appearance is described as ornate, and they are made in a variety of shapes to fit them for all uses. The radiators are made with pressed steel top, which is light and rigid; also ornamental wooden or marble tops can be furnished if desired. In Fig. 1 a general view of the radiator is presented with the top broken away showing the coils. The circulation in the radiator is indicated in the cuts Figs. 2 and 3.



The Windsor Hot Water Radiator.—Fig. 1.—General View of Radiator.

Fig. 2.—Section Showing Circulation of Water.

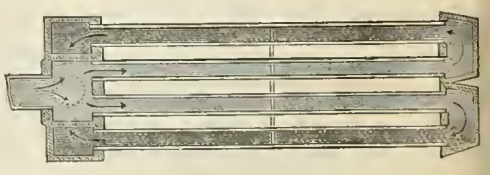


Fig. 3.—Section Showing Circulation of Water.

SCRAP.

N. & G. TAYLOR COMPANY, Philadelphia, send out a circular printed in red and black, showing in a negative way the advantages of the genuine Taylor Old Style Plate. The feature of the circular is a photographic reproduction of a piece of tin plate which they say was made by the same process as the imitations of the Genuine Taylor Old Style. The engraving, which is a half tone, has the appearance of an unsymmetrical sieve, due to the corrosion of the plate.

EXPORTS of tin plates from Great Britain to the United States during the month of February were 13,000 tons, as compared with 20,000 tons in the corresponding month of last year. The total exports to all countries for the month were 23,000 tons against 29,000 tons in February, 1893.

THE WORKS of the American Tin Plate Machine & Mfg. Company, at Linfield, Pa., are in full operation, making about 10 tons a day of finished plates. The specialty of the company is the production of continuous roofing plate, made by the Buckman process. The improved automatic continuous machinery at present in use is being duplicated, and the output will shortly be doubled. The company are said to have closed a contract for the entire output of the works for one year from February 1, 1894. The officers of the company are: P. B. Calvert, president; S. Y. Buckman, vice-president and general manager; and E. B. Smith, secretary and treasurer.

THE LEECHBURG FOUNDRY & MACHINE COMPANY of Pittsburgh, Pa., have secured an order from the Aetna-Standard Iron & Steel Company, Bridgeport, Ohio, for the changing of two of the steel mills of the latter concern into tin mills. This includes a new outfit of rolls, and also two 36-inch doubling shears with engine, two new cold rolling mills and one Mesta patent pickling machine, with vats, crates and everything complete. It is expected to have this work completed about May 1 next, at which time the Aetna-Standard Iron & Steel Company will be in position to furnish black sheets for tinning purposes. It is probable that within a short time after the above date the Aetna-Standard Iron & Steel Company will put in the necessary tinning machinery and will engage in the manufacture of tin and terne plate.

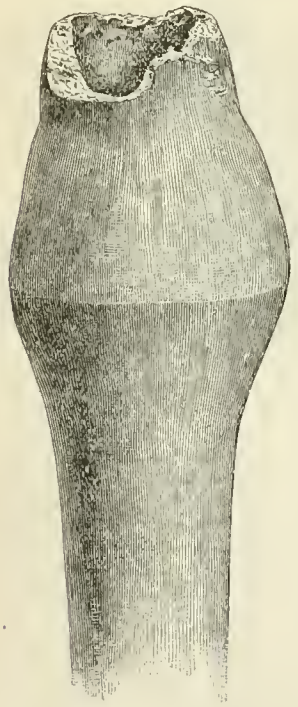
IT IS ANNOUNCED that a tin plate manufacturing firm in South Wales have recently secured several large orders from Russia for tin plates, to be used in canning beef. This is said to be an entirely new trade, and most acceptable to the Welsh makers, who are eagerly looking round for new markets for their product, to take the place of the waning American trade.

The Indian Government proposes to meet its revenue deficit by a general 5 per cent. duty on imports, including silver, and by doubling the present duty on petroleum.

PLUMBING and GAS FITTING.

Water Hammer in Boiler Connections.

The subject of the illustration was furnished by John Gormly, 1433 Columbia avenue, Philadelphia, and represents a piece of pipe which was taken from a job where he was called to make some repairs. The broken end shows the solder in a joint that was wiped on the side connection to a kitchen boiler, and which was swelled and broken, Mr. Gormly states, by water hammer. The enlargement is very uniform, there being no special swelling in one side as is usually the case, and it will be noticed that the solder has stretched quite as much as the pipe. The pipe is very heavy, ¾-inch pipe, which shows the power of the concussions which finally broke the joint, after a leak which occurred in the swelled part had been stopped by hammering metal into the



Water Hammer in Boiler Connection.

opening. To those who are not acquainted with water hammer it is explained as being due to steam that has formed in the water back passing to a point where it condenses, creating a vacuum which is filled by an inrush of water that strikes with a much greater force than is generally appreciated. When a water back is large and steam is generated freely this striking is frequent and the result is as shown. A larger opening or a water way of the full size of the pipe through the side connection would carry the steam into the boiler before it condensed.

THE PLUMBING FIRM of Blake & Burke, Rock Island, Ill., composed of J. D. Blake and T. F. Burke, was dissolved on March 5, Mr. Burke retiring from the firm. Mr. Blake will associate himself with D. T. Murphy to carry on the business under the firm name of Blake & Murphy. Mr. Burke, the retiring member of the old firm, will embark in the plumbing business on his own account.

TRAPS AND VENTS.

WM. BLAKE has opened a plumbing shop at Benwood, Ohio, a suburb of Wheeling, W. Va.

MANCHESTER, N. H., has passed a plumbing ordinance, to go into effect May 1.

J. WILLIAMS, Peru, Ill., is about to move his plumbing shop to the store next to Lang's jewelry store.

CHARLES DEDICKE, who has been employed in the factories of Alfred Dolge, at Dolgeville, N. Y., for something over 12 years as a plumber and steam fitter, has resigned his position and gone into business for himself. He has opened a store and workshop in the Spofford Block, under the Odd Fellows' Hall.

HENRY W. WERST, president of the Werst Plumbing Company, Louisville, Ky., died last week after a brief illness.

FAIR HAVEN MARBLE & MARBLEIZED SLATE COMPANY, Fair Haven, Vt., who make a specialty of reproductions of fine interior marbles, are wainscoting the church of St. Paul the Apostle, New York, using Lisbon, Alps, Green and Mexican Onyx, and are building a white marble altar for St. Patrick's Church, Pottsville, Pa. This concern also make a large line of plumbers' and builders' slate work.

P. FLEMING, Brattleboro, Vt., will add to his plumbing business a complete line of stoves and tinware.

THE DETROIT SANITARY SUPPLY COMPANY, Detroit, Mich., recently filed articles of incorporation. Capital stock, authorized, $100,000.

T. F. BURKE, Ernest Wagner and John Joers, Rock Island, Ill., have filed an application with the Secretary of State for permission to organize a company to do a general plumbing business. They have rented the two store rooms in the Buford Block, on East Seventeenth street, in the rear of Jonas Bear & Co.'s store. The company will carry a full line of heating and plumbing goods.

GEO. GOODSELL, the plumber who has been working for Williams Bros. for the past two years, has resigned his position. Mr. Goodsell and Dan Pickett will open a shop in Music Hall Block, at Crawfordaville, Ind.

THE NEWTONVILLE HEATING & PLUMBING COMPANY opened their place of business in Tremont Block, at Newtonville, Mass., last Monday.

C. A. HASTINGS will engage in the plumbing business as a member of the firm of Crosbere & Hastings, Claremont, Mass.

THE PHILADELPHIA BOARD OF CITY TRUSTS contemplates the establishment of a plumbing class at Girard College, in that city. One of the members of the board recently inspected the Master Builders' Mechanical Trade Schools at the Builders' Exchange, Philadelphia, to gather information in regard to the successful plumbing class which has been in operation there for some years.

NAPOLEON MYETTE AND ZENON ST. AUBIN, plumbers, of Montreal, Canada, have dissolved partnership.

THOMAS ASHE has sold out his plumbing business at Knoxville, Tenn.

THERE was recently incorporated at Indianapolis, Ind., the Aluminum Bath & Mfg. Company, to manufacture and deal in aluminum bathtubs and specialties. Capital stock, $9000. Directors, B. F. McFarland, A. C. Jenks and L. W. Forbes.

HARWOOD & GILDER, plumbers, will move into the Market street store room, Warren, Ohio, now occupied by Mikesell & Shaffer, April 1.

THE MAYOR OF BUFFALO, in addressing the master plumbers' convention, spoke of 150 miles of well cleaned asphalt streets, a fine system of sewers, and attributed the fine sanitary condition of the city to the aggressively progressive plumber.

SECRETARY CHAS. SCHLOESSER of the Master Plumbers' Association of New York City was elected secretary of the State association at the convention at Buffalo.

COULMAN & WESCOTT, Fair Haven, Vt., are furnishing the slate work for lavatories and closets for two new public schools at Holyoke, Mass.

PRESIDENT DANIEL G. FINNERTY of the National Association of Master Plumbers has forwarded to the relations of James G. Weldon, at Pittsburgh, who died a short time ago, a letter of condolence, expressing the great loss sustained by the National Association in Mr. Weldon's death.

THE BUSINESS formerly conducted by Worden & Brady, Bayonne, N. J., which was dissolved on January 1, is being conducted at the old stand, 667 Avenue D, by Walter Worden, who conducts a first-class plumbing business, besides keeping on hand a general line of hardware, house furnishing goods, stoves, ranges and heaters.

THE PHILADELPHIA COUNCILS HIGHWAY COMMITTEE on the 12th inst. met to consider the ordinance to regulate the issue of permits for opening streets and roads and the charges to be made therefor. A number of plumbers were present. The ordinance requires that each permit for an excavation in a public highway shall be taken out before the work is commenced; that it be kept at the place of excavation while the work is being done, and be exhibited whenever called for by the police or other persons having authority to examine the same. The ordinance also provides that a contractor taking out a permit shall make a deposit of $50 to cover any expense which the city would be put to in repaving the street.

The plumbers strongly opposed the ordinance as framed, claiming that considerable difficulty would arise in the way of making an estimate as to the cost, different prices for different paving being provided for in the ordinance. The bill was finally deferred until Monday next, when final action will be taken.

GEORGE W. LARSEN, formerly connected for many years with George C. Blessing & Co., has begun business for himself at 56 Beekman street, New York City, as manufacturers' agent for the sale of plumbing materials. He also makes a specialty of slab and marble work.

R. A. DODSON, late with C. L. Keck's plumbing department, has opened a store in the Myers Building, on Berwick street, Whitehaven, Pa.

THE WILKESBARRE, PA., firm of Stevens & McGrath, heating and ventilating engineers, sanitary plumbers and sheet metal workers, have been succeeded by Stevens, McGrath & Gilchrist. The new partner is Wm. B. Gilchrist. They will shortly remove from Lincoln street to 180 East Market, where they will have increased facilities.

SCOTT & AHEARN have broken ground for their new plumbing establishment, corner of South Washington avenue and Atwater street, Saginaw, Mich.

THE FIRMS of James H. Spence & Co. and E. T. Doyn have been consolidated under the firm name of Doyn & Spence. The new firm will continue business at the old stand of J. H. Spence & Co., 122 Grand avenue, Milwaukee, Wis.

THE FIRM of Sullivan & Macbeth, Mankato, Minn., dissolved partnership, and Mr. Macbeth will carry on the plumbing business at the old stand.

THE BRANDT SUBMERGED WATER HEATING COMPANY, 22 Drummond Block, Toledo, Ohio, are issuing circulars of their heater, which is adapted for bathtubs, baptistries, &c. The apparatus is weighted to set down in the water and uses either gas or gasoline to heat the water. It is stated that the water in a bathtub can be raised from 50° to 115° in temperature in from 15 to 25 minutes.

THROUGH the kindness of City Inspector of Plumbing Samuel A. Robinson, Washington, D. C., we receive a copy of the amendments to the plumbing regulations of the District of Columbia.

AN ODE to the sixth annual convention of master plumbers of the State of New York, composed by a plumbing bard, was set to the tune of "Auld Lang Syne" and sung by over 200 voices at the close of the convention.

THE L. WOLFF MFG. COMPANY, Chicago, are to establish a branch store for the sale of their plumbing goods at Minneapolis, Minn., from where orders can be filled. The store and basement at 11 Washington avenue, North, has been leased and will be placed in charge of F. J. McArdle.

J. A. FAIRBANKS & Co. have opened a new stove and tinware store and plumbing establishment in the Burr Block, on Main street, Brewer, Maine.

MICHAEL J. DUNNE has been appointed by the Board of Health Plumbing Inspector for Kingston, N. Y., with a salary of $750.

The Chicago Master Plumbers.

The Chicago master plumbers held a meeting at their rooms, 197 Madison street, Monday evening, March 12. The meeting might have been likened to a theater where the manager was obliged to post a notice "Standing Room Only," so great was the attendance. It was cheering to the heart of President Paul Redieske on his return to take up the duties of his office, blessed with renewed health and vigor, to see the large number present to welcome him home.

Quite a discussion ensued regarding the best means to employ for protecting plumbers from loss from irresponsible parties. Instructions were given to the Arbitration Committee as to the articles of agreement to be entered into with the journeymen plumbers. Resolutions of condolence to the family of Jas. G. Weldon, Pittsburgh, deceased, member of the National Executive Committee, were adopted by a rising vote. The secretary was ordered to have the following engrossed and mailed to Mr. Weldon's family:

We have learned with the deepest regret of the death of our friend and associate Mr. Jas. G. Weldon of Pittsburgh In view of the exalted character of our departed brother, and of his many acts of kindness and generosity which make his memory dear, it becomes our manifold duty to offer words of sympathy and condolence to the members of his bereaved family, and also the members of the Master Plumbers' Association of the city of Pittsburgh, of which he was a most noble and worthy representative.

Be it therefore resolved, That through the death of Jas. G. Weldon we have lost a dear friend and brother, and that the National Association of Master Plumbers has been deprived of one of its most faithful and devoted officers and most loyal adherents.

Resolved, That we cherish the memory of the dear departed, and be ever faithful to those principles of right, justice and truth for which he was so eminently favored, and for which he so earnestly labored during his brilliant career.

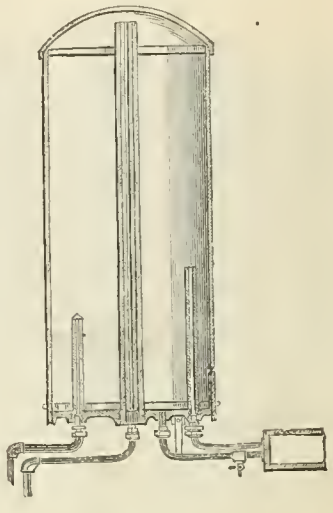
Resolved, That the Chicago Master Plumbers' Association in deepest sorrow extend its most sincere sympathy to the members of his afflicted family.

Resolved, That the Chicago Master Plumbers' Association prove that distance is no barrier to brotherhood, and that while their Pittsburgh associates are mourning for their honored member, we too would mingle our grief with theirs in bonds of unity and true fraternity.

Duncan's Patent Circulating Boiler.

The illustration herewith is of a circulating boiler placed on the market by W. E. Duncan of Forty-ninth street and Woodland avenue, Philadelphia. The cold water supply pipe enters the boiler through the bottom, and is carried upward 12 inches, making it non-siphonable; the top of the pipe has a deflector to throw the cold water to the bottom. The top circulating pipe is carried 18 inches up into the boiler and the bottom circulating pipe discharges direct from the bottom of the boiler into the water back. The hot water is taken from the top of the boiler by means of a tube within a tube, allowing of a circulation of air between them, with an opening at the bottom. This, it is claimed, enables the hot water to be discharged from the bottom of the boiler, without coming in contact with the cold water. The bottom shell of the boiler is made with three legs under it, to which connections are made, thus affording free access for a wrench.

The advantages claimed for the boiler are that outside piping is done away with; that there is a saving in the quantity of pipe necessary for connections, consequently a saving in the labor incident to making connections; it can be placed on any boiler stand, on brackets or on the floor; it may be placed on the floor of a bathroom, thus,



Duncan's Patent Circulating Boiler.

without loss of efficiency, answering the purpose of a hot water radiator and necessitating only an outlay sufficient for a few feet of circulating pipe, the supply and hot water pipes being connected at the bathtub.

The Fourth Annual Ball of the Cape Cod Commercial Travelers' Association was held at Odd Fellows' Hall, Boston, on Friday evening, March 9. Many well-known traveling men connected with the trades represented by *The Metal Worker* are members of this organization. Among those in attendance were: J. S. Crapon, with St. Louis Stamping Company, Boston, Mass.; Geo. E Hunt, with Henry N. Clark, Boston, Mass.; Andrew Hawes, with S. G. Davis & Co., Boston, Mass.; E. L. Richards, with Frye, Phipps & Co., Boston, Mass; J. F. Randall, with Baldwin, Robbins & Co., Boston, Mass.; F. E. Mayo, with Dame, Stoddard & Kendall, Boston, Mass.; W. B. Bangs, Provincetown, Mass.; E. F. Keeler, Hudson, Mass.; W. H French, West Newton, Mass. There was a concert from eight to nine followed by dancing until two. About 100 couples participated, and the entertainment was a complete success. J. S. Crapon and George E. Hunt, among others, were active as floor managers.

A widely circulated report that Philip D. Armour, the Chicago millionaire, had given $500,000 for the establishment of a trade school in San Francisco, is denied by Mr. Armour. He says he has no such intention.

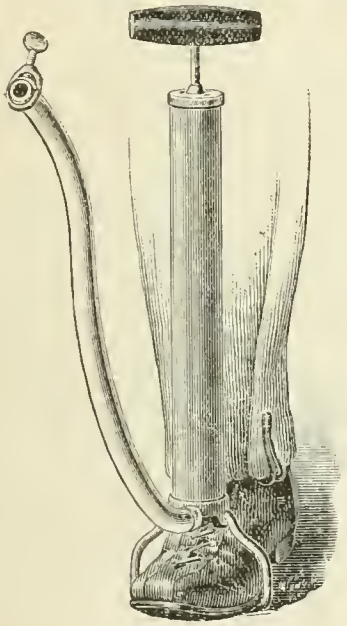
The authorities of Binghamton, N. Y., have declared the nickel in-the-slot machines to be gambling devices, as construed by the penal code.

Dr. Ernest Hart, of the *British Medical Journal*, expresses a belief that within the next 30 years cholera will become extinct before the march of sanitary science.

THE RETAIL STORE.

Heath's Ball Valve Pump.

The accompanying cut represents a bicycle pump, put on the market by S. F. Heath Cycle Company, Minneapolis, Minn. The barrel is 1¼ x 12 inches in size, and the pump is capable, it is stated, of raising a pressure of 100 pounds to the square inch. Attention is directed to the universal coupling on the end of the hose, by means of which, it is explained, connection can be easily and quickly made with any valve. The stirrup in which the foot is placed is



Heath's Ball Valve Pump.

hinged to allow the barrel to oscillate with the motion of the hand, and may be folded back against the barrel when carrying the pump. It is stated that the pump weighs about 2 pounds, and that it may be carried on a wheel if desired. The pump is nickel plated and guaranteed by the manufacturers not to break.

Solid Steel Seamless Kettle.

The Cleveland Stamping & Tool Company, Cleveland, Ohio, are offering solid steel seamless kettles, as shown

Solid Steel Seamless Kettle.

herewith. The kettles are referred to as being made seamless from cold rolled wrought steel. A feature of the kettle is the handle for tipping, when emptying its contents. A full line of these goods are made of flat and round bottom deep kettles, maslin kettles and stew pots, which are furnished either polished inside, tinned or enameled.

The Sanitary Garbage Pail.

The cuts here shown represent the sanitary garbage pail, offered by Sanitary Garbage Pail Company, 87-89 Shelby street, Detroit, Mich. The pail is made of galvanized iron, and is usually attached to an alley fence, or where it is easily accessible to the garbage collector. It requires a space of 12 x 24 inches, is filled from inside the premises and emptied from without. The pail can be removed from the fence for emptying into the collector's wagon, the collector being supplied with a master key to unlock the pail, which secures the exclusive use of the pail to the owner. When the pail is replaced in the trunnions and pushed back into

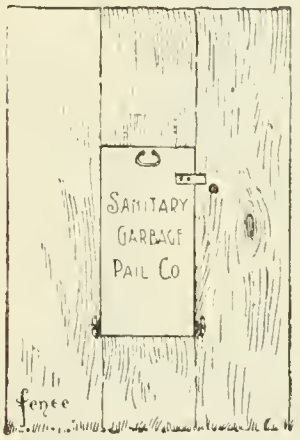


Fig. 1.—The Sanitary Garbage Pail.

position it is stated that it closes its cover and locks itself. It is remarked that it works perfectly in winter, it being 18 x 12 inches at the top with a 2-inch radius bottom, and when upturned the weight of the contents forces the matter to fall out. The point is made that this obviates the use and

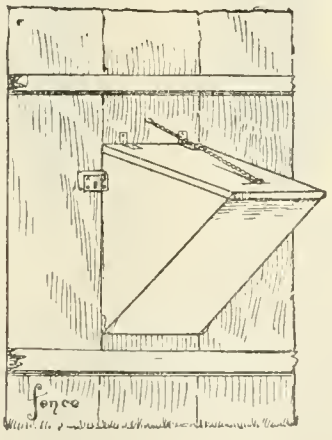
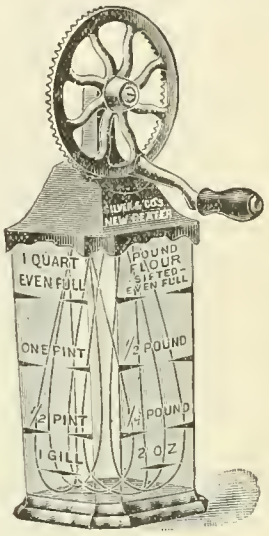


Fig. 2.—Pail Inside the Yard.

possible penetration of the receptacle by the insertion of a shovel or pick.

New Beater and Dessert Maker.

Silver & Co., 304-310 Hewes street, Brooklyn, and 20 Warren street, New York, are offering a beater and dessert



New Beater and Dessert Maker.

maker, as shown herewith. The receptacle is of glass graduated, and may be used separately for measuring and weighing liquids, sugar, flour, &c. The top is of tinned iron, with a wheel 4 inches in diameter. The wire beaters are rigid at the bottom, being bound together by wire. The device is a combination beater and measure for beating eggs, whipping cream and for making cakes, custards, &c.

Aluminum Products.

The Wohler Aluminum Company, 55 Jackson street, Chicago, issue a 28-page catalogue, giving full particulars of the great variety of aluminum manufactures now offered by the company, who are representatives of the Pittsburgh Reduction Company, Western agents and distributors for a great many producers of aluminum goods, and also manufacturers of the metal in some special lines. They offer Ingot Aluminum, Castings, Plates and Sheets; Seamless Tubing, Bars, Angles, Channels, Beams, Tees, Rods, Wire, Leaf, Foil and Bronze Powder. Tables of gauges, weights and dimensions are given whenever such particulars are desirable. A considerable part of the catalogue is devoted to aluminum cooking utensils, which resemble silver in appearance, are made of the solid metal, have no enamel, and are claimed to be practically indestructible. The line of these wares which are offered covers Saucepans, either bailed or handled, Fry Pans, Bake Pans, Wash Bowls, Dippers, Cups, Coffee Pots, Tea Pots, Hotel Stewpans, &c. The company are about to put on the market a full line of Spoons, which will closely resemble sterling silver, being composed of aluminum mixed with a sufficient quantity of silver and other high priced metals to make a combination of sufficient density or hardness to be suitable for table ware. The catalogue further contains a comprehensive list of novelties, fancy goods and specialties in aluminum, including jewelry

ROOFING AND CORNICE.

Fred F. Bischoff & Co.

One of the most complete factories in the country for the manufacture of ornamental sheet metal work has just been completed at Libertyville, Ill., by Fred F. Bischoff & Co. It comprises two buildings. The larger is 225 x 60 feet, one story high, and is divided into several compartments. In the center are the boiler and engine rooms. An engine of 100 horse-power, built by the Erie City Iron Works of Erie, Pa., furnishes the power. Adjoining the engine room is the stamping room, in which are ten presses, five of them being operated by power and the others by hand. The large presses are of the firm's own design. They are powerful presses, with very heavy bed plates and massive foundations. The largest of these has a bed 30 inches square, and is used for making imitation brick siding, rock faced siding, ceiling, Spanish tile, &c. It will turn out 6000 square feet a day, the sheets coming out perfectly straight, without a buckle. The other presses are used for making moldings, ornaments and special designs in pressed metal. The company manufacture all their own dies and make their own patterns in the pattern shop next to the stamping room. Here designers are constantly at work. Models are first made in clay, after which patterns are produced in plaster and subsequent copies are made in wax. Architects' sketches are thus worked out, often from mere suggestions. The patterns are then used for molding zinc dies in sand. Two pots melt the zinc for these castings. At the opposite end of the same building is the paint shop, in which 10,000 square feet of sheet metal can be painted in a day.

The other building is 180 x 60 feet, two stories high. The whole of the second story is thrown into one room, which is well lighted, has a high ceiling and forms an ideal workshop. It is used for making sheet metal bathtubs and for general tin work. The bathtubs are constructed of galvanized sheets, shaped on a very large brake built by Geo. C. Keene & Co. of Cincinnati. It is operated either by power or hand and will take an 8-foot sheet. The tubs are shaped like porcelain or cast iron tubs and are handsome in appearance, being enameled inside and outside, finished with a rim of polished hardwood and decorated with electroplated pressed zinc ornaments. They are very light, yet strong and durable, and in cost occupy a position intermediate between copper and cast iron tubs. When running full this department could turn out 50 tubs per day. This is the only establishment in the country making tubs of this character. The lower floor of the same building is used for offices, spinning and soldering and shipping. The spinning and soldering department is an important feature of the works. Here fine ornamental work is put together. A number of colossal sheet metal statues are now on the floor receiving their finishing touches. Two of these are statues of Justice, one represents Liberty and another Gambrinus. In this room is a large power punch press for heavy work. A novel departure in sheet metal work completed in this room is the manufacture of sheet steel dashboards for buggies. These are made of two pieces of sheet metal, which are separately pressed with stiffening ribs, then put together and lap seamed, after which they are japanned, and present an exact imitation of a leather dashboard. The shipping room is fitted with a large number of racks in which are stored pressed metal moldings, ornaments, &c., each rack being numbered to correspond with the numbers in the firm's catalogue, thus facilitating the work of the packers and shipping clerks. From this room a platform extends outside on a level with the floor of a freight car. A side track runs to the works from the Chicago, Milwaukee & St. Paul Railroad, giving the firm excellent receiving and shipping facilities.

The buildings are of frame but are very substantially built and are covered with the firm's steel rock faced siding, presenting an extremely pleasing appearance. The works are lit with gas manufactured on the premises. The firm's specialties are ornamental sheet steel ceiling, roofing and siding; steel, copper and tin Spanish roofing tile; sheet metal ornaments of every description; sheet metal bathtubs and statuary. Their main office and warerooms are 24 and 26 West Lake street, Chicago.

Conductor Reducers.

We show in the accompanying illustrations two forms of conductor reducers, manufactured by the Garry Iron & Steel Roofing Company, Cleveland, Ohio. Style A is shown in Fig. 1 and is made to take the pipe straight into the top, while style B, shown in Fig. 2, will take the pipe in at an angle, saving the use of elbows, before the pipes enter the reducer. The manufacturers, however, recommend the style A, as the water enters straight with the reducer and will flow through better.

Fig. 1.—Style A.

Fig. 2.—Style B.

Conductor Reducers.

FLASHINGS.

THE F. J LEWIS ROOFING & MFG. COMPANY, Omaha, Neb., are erecting on their grounds, at Eleventh and Nicholas streets, buildings for the manufacture of roofing paper, building paper, prepared paper, and for the distillation of cold tar pitch.

"THE LIFE OF AN IRON ROOF, or How Long will it Last," is the title of an instructive little book upon a most interesting subject which is distributed by the Cincinnati Corrugating Company of Piqua, Ohio.

THE WORKMEN of T. B. Dewees & Co., Phœnixville, Pa., are engaged in tinning and spouting a large building at the Bean sand crusher, at Valley Forge.

A NOVEL CIRCULAR is issued by Gara, McGinley & Co., 13 South Seventeenth street, Philadelphia, Pa. It is a reproduction of a series of advertisements that are now running in the Philadelphia street cars. They are cleverly worded and all of them are attractive. An example of these advertisements is: "Say a little but say it strong. We do one thing well. We mend roofs. Everywhere is convenient to us—telephone—street cars—walking. Roofers in tin, copper, slate and tile. Gara, McGinley & Co., 13 South Seventeenth street."

THE CONTRACT for the copper cornice work, slate and composition roofing, skylights, &c., for the City Hall, Milwaukee, Wis., has been taken by C. W. Rickert, 194 Clark street, Chicago.

THE COLUMBIA CORRUGATING MFG. COMPANY, Niles, Ohio, manufacturers of all kinds of iron and steel roofing, have a factory at Niles measuring 60 x 200 feet, and one at Chicago 100 x 100 feet in size. The firm expect to add other items to their present line of work as fast as they can be reached. Their present equipment consists of machinery for the manufacture of roofing, corrugating iron, galvanized sheets, metal lathing, &c. This concern will at once apply for a charter of incorporation.

THE WHEELING CORRUGATING COMPANY, Wheeling, W. Va., have recently added to their equipment machinery for the manufacture of galvanized steel and tin eaves trough, conductor pipes, hangers, &c. This machinery has been put in operation and is working very satisfactorily. This firm are now in position to fill all orders for this material promptly, and expect to become one of the largest producers of it. They have recently gotten out some new ceiling designs which are shown in their new catalogue. A branch office has recently been opened at 472 Laflin street, Chicago, at which location a stock of everything made by the concern is carried for the convenience of trade tributary to Chicago.

H. FITZBERGER & SONS of 213 Park avenue, Baltimore, Md., have recently completed a large contract for copper work on the Ohel Sholom Temple, a new Jewish synagogue in Baltimore. The work consists of a dome lantern 15 feet high and 8 feet diameter, with a

large circular Fitzberger patent skylight at the base, a dome base about 20 feet high, with star windows and mosaic ornamentation, and all the cornice work in the building.

An important deal in slate is reported from Bangor, Maine, as having just been consummated. The Monson Slate Company of that city have purchased the entire Merrill slate quarry property in Brownville at a cost of about $300,000, thus consolidating the most important quarries in Maine. It is thought that this action will result in better prices for all slate products and promote business in that district.

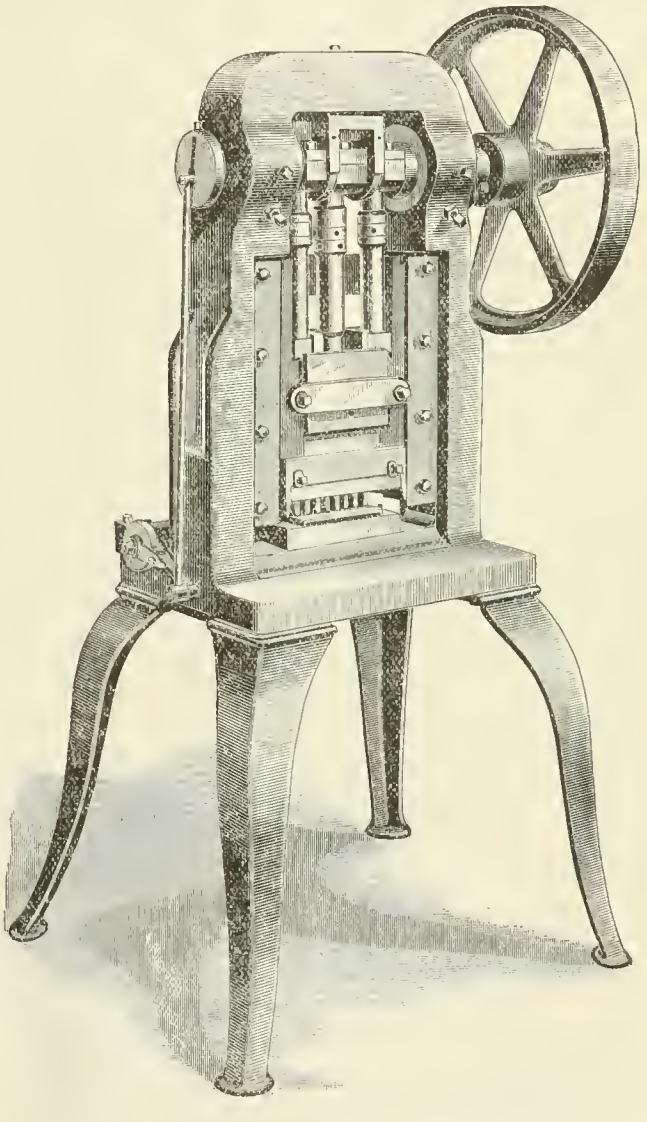
The catalogue lately issued by the Wheeling Corrugating Company of Wheeling, W. Va., is a handsome example of trade publication and is worthy of the fine work done by this concern. It is of pamphlet style, contains 30 pages and measures 12 x 9 inches. The binding is in brown cardboard, with a stamped design on the front cover printed in silver. The publication is devoted to continuous ceiling designs made by the Wheeling Corrugating Company, who also manufacture patent steel ceilings, roofings, corrugated iron, eaves trough and conductor. The text of the catalogue directs attention to the advantages of continuous steel ceiling, which does not limit user to a few fixed sizes of paneled plates. The remainder of the text is briefly descriptive of the ceilings and also includes directions for applying them, one of the illustrations being a sectional view through a ceiling and cornice, illustrating the application of the sheet metal. The chief feature of the book is the half-tone engravings of the designs themselves. A large variety of different designs are illustrated and it is needless to say that many of them are exceedingly attractive and all of them are reproduced with great beauty and accuracy in the photo-engraved illustrations. The engravings show designs, small sections and full ceilings, likewise interior views of apartments finished with these goods. At the end of the book, illustrations of embossed and corrugated sheets are given.

The Porter Iron Roofing & Corrugating Company, 101 and 103 West Front street, Cincinnati, Ohio, desire to deny most emphatically the report that they intend to remove their works from Cincinnati. This report found its way into our columns in the issue for the 3d inst., and was apparently based on good authority. The company, however, state that the report is absolutely false with regard to them. They have been established in Cincinnati for upward of 20 years and now claim to be the oldest established iron roofing concern in the United States. They have done business so successfully and satisfactorily at the old stand that they have no intention of abandoning it. The foundation for the report is the fact that one who was formerly connected with the company proposes to engage in business for himself in Indiana.

A striking illustration of the depreciation that has taken place in the value of industrial securities during the past year is reported from Lowell, Mass. A calculation of the present selling value of the stocks of the leading manufacturing companies in that city shows that they have lost in the aggregate fully $3,000,000, as compared with a year ago.

Double Action Gang Power Press.

This press has a roll feed attachment, which is stated by the makers—the Cross & Speirs Machine Company of Waterbury, Conn.—to be accurate in its movements. The shaft is of steel, with copper and tin boxes. The gate or slide is unusually long and is provided with large bearing surfaces; it runs in copper and tin ways, which may be set close without heating, thereby preventing the tools from shearing. The machine will cut and draw from 4 to 20 shells at every action of the slide, and it may be run at 230 revolutions per minute. Two sizes of this press are built, one weighing 1400 pounds and the other 2000 pounds.



DOUBLE ACTION GANG POWER PRESS.

The announcement of a new course in practical chemistry at the Brooklyn Polytechnic Institute is exciting much interest. The course includes thorough instruction in experimental chemistry and the various branches of chemical analysis, pure and applied chemistry, and other branches necessary to the analytical and technical chemist. Special attention is to be paid to instruction and laboratory work in organic chemistry, and also to the study and testing of technical products, wastes, processes, &c. The new laboratories are commodious and are provided with the apparatus and chemicals required in analytical, experimental and research work. The course will include physics, modern languages and drafting. The study of chemistry begins in the freshman year, and in each successive year will occupy more of the student's time. Facilities are also to be given for post-graduate work in both pure and applied chemistry and in chemical engineering. The new chemical course will be under the direction of Peter T. Austen, late professor of chemisty in the New Jersey State Scientific School and Rutgers College. He will be assisted by William M. Grosvenor, Gillett Wynkoop, H. M. Baker, Jr., and others.

So many fishing vessels have been lost this winter that the Gloucester, Mass., builders are crowded with orders for new craft. Their yards will be kept very busy for several months.

A plan has been submitted by the engineers of the Brooklyn elevated railroads for a superstructure to be built over the existing railroad on the Brooklyn Bridge, in order to allow the elevated trains to run directly into New York. Mr. Roebling, who was one of the builders of the bridge, declares emphatically, however, that the added structure would impair its safety and has reported unfavorably on the scheme to the bridge trustees.

Press Working of Sheet Metals.—III.

BY OBERLIN SMITH

Dies.

Having in the previous chapters attempted to define, briefly describe and to some extent classify presses of various kinds, it will now be well to define the tools complementary thereto which are known as dies, and at any rate in a practical if not in a strictly scientific manner. Such dies, as far as sheet metal work is concerned, may be defined in general as a pair of special tools so related to one another that when properly guided and approached toward each other, with sufficient pressure, they will produce a definite, uniform and permanent change upon each one of certain similar pieces of proper material placed between them.

Fig. 15.

Fig. 16.

Fig. 17.

Fig. 18.

Fig. 19.

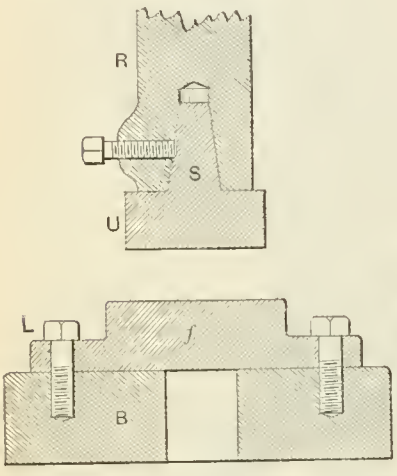


Fig. 47.

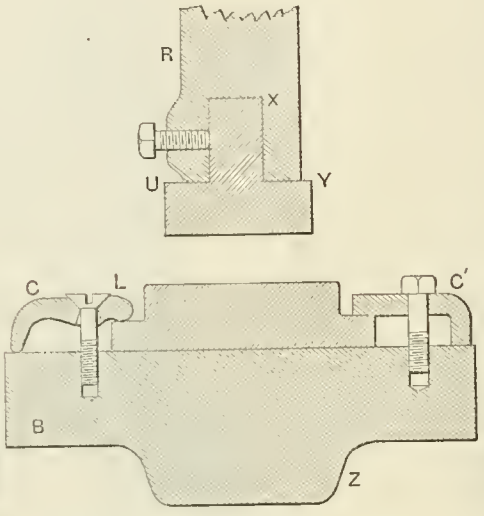


Fig. 48.

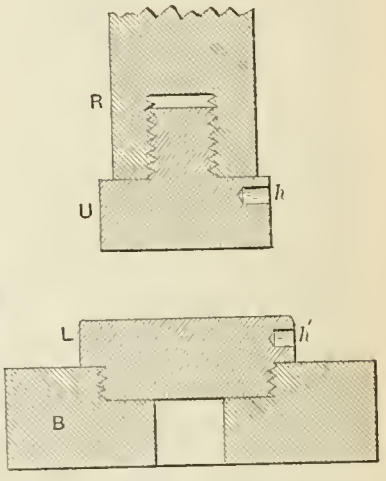


Fig. 49.

Fig. 50.

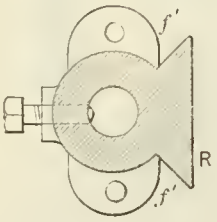


Fig. 51.

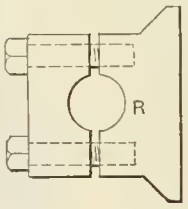


Fig. 52.

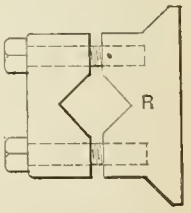


Fig. 53.

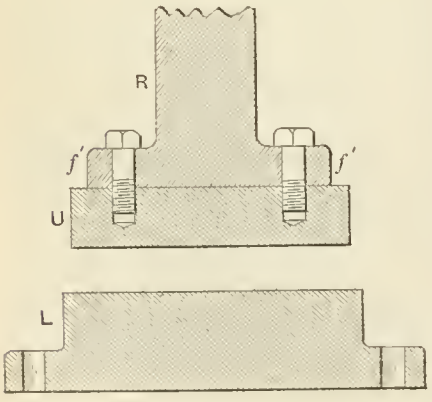


Fig. 54.

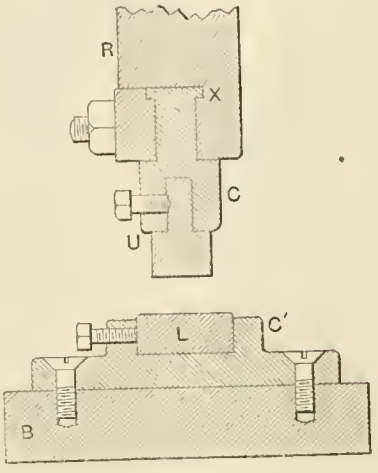


Fig. 55.

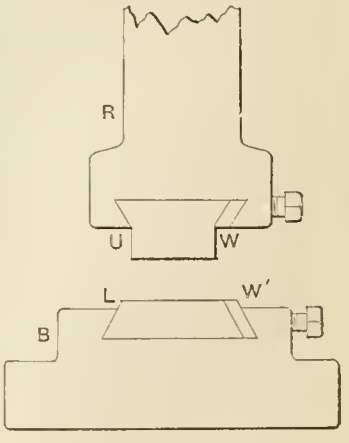


Fig. 56.

Classification by Functions.

Like presses, they are somewhat difficult to classify, but not to so great a degree. In this treatise I will classify according to their functional character only, and will not attempt to do so by the material they are made of, by the kind of press they are fitted to, by their method of construction, or any other of a dozen systems that might be contrived. In each class, as, for instance, cutting dies, there will be necessarily a number of varieties, based somewhat upon the material to be worked and the condition in which it is to be put. No attempt will be made at a disquisition upon the art of die making, as this might well occupy a complete volume in itself. The chief purpose of these chapters is to describe the operations practiced by the sheet metal worker, as

he views them from his standpoint, or, rather, as he should view them. In carrying out this idea it has been necessary to refer to the different forms of presses without going into the details of their mechanical design. Dies will be herein treated the same way, only such details of their construction being given as are necessary to illustrate their action, both in theory and practice. In describing each general class some advice may be given as to certain good points in these tools which should be looked after by their users, but the methods of manufacturing them and their exact design, as far as concerns the best modes of putting together, &c., will be left to the unknown makers thereof.

While speaking of dies in a general way, and before entirely leaving the subject of variations in presses, it will be well to show by illustrations a few of the most common methods of fastening dies to the beds and rams respectively of the presses in which they are to be used. Some of these varying methods are equally good, but an important point with the user of such tools is to arrange for interchangeability to the greatest possible extent—not only that given dies may fit as many presses as possible as far as the kind and size thereof will permit, but especially that the hundreds of dies which he very probably has on his shelves (either actually or in prospect) may, as many as may be, fit in common a given press. Too much importance cannot be attached to the attainment of a strict system of uniformity in these fastenings so that certain dies can be quickly taken out of a press and others substituted, but also that there may be as few changes as possible in the adjustment of the press itself.

Bolsters.

In Fig. 47 is shown, in vertical axial cross section, a bolster, B, on which is fastened by tap bolts screwed into the same a lower die, L, it being understood that this bolster is, as usual, simply a flat plate bolted or otherwise secured to the bed of the press to which it belongs in the customary way—such bolsters being generally furnished by the press makers, either as a standard part thereof or especially to order. They often have a hole of some size and shape through them, as in Fig. 47, but are sometimes solid, as in Figs. 48 and 54. The general object of a bolster is to occupy some of the spare room up and down which is usually allowed in case extra high dies should be required for some special purpose, and also to partly cover up and bridge over the large hole which is usually made through a press bed, that work of a maximum size may sometimes be dropped through. Both of these objects are obviously to enable smaller and cheaper lower dies to be used for average work than would be the case were each die required to be thick enough and to have its flange or plate F, Fig. 47, spread out far enough to reach the bed bolts of the press which usually secure the bolster. In the same figure R is the lower part of a press ram, in which is inserted the upper die U, it being shown in this case with a tapering shank, S. This drives tightly into the socket of said ram and is prevented from slipping out by a set screw, which, for better security, is usually made with a point countersunk into the shank. To save complication, these dies are shown perfectly flat upon the faces which come together, and in this shape may be regarded as flattening dies, such as are frequently used for straightening and compressing small articles. Almost any variety of dies can obviously be secured by this and the other methods to be described.

Securing Dies.

Fig. 48 shows shank of die U cylindrical instead of conical. In this case the set screw does not need, necessarily, to be countersunk therein. The top end of shank at x is shown as having a bearing against top of ram hole, as well as the top surface of the die proper at y having its bearing upon the bottom of ram, it being better in all cases to have as much contact of solid metal as possible, to carry the heavy compressive stresses incident to all work of this kind. The bolster B is shown with a truss or boss, z, projecting below its bottom surface and extending downward into the bed of press. Such trussed bolsters are often useful for heavy work that happens to be concentrated near the center. In this case the lower die L is shown fastened by tail clamps C, C', the latter being of a crude form often used, where a piece of bar iron is simply bent at right angles and a bolt hole is thrown at it, so to speak, almost anywhere, instead of being put as close to the die as possible. Such a construction not only enables the clamp to bend down, but loses a good deal of the leverage that may be gained by arranging the proportions as in clamp C, where the bolt is put near the die. This clamp is of better design for withstanding bending strains, being thickened at the bolt hole. It is also rounded upon its lower surfaces at each end, and provided with a spherical headed screw (sunk below the surfaces out of the way of work catching against it), all of which allows it to accommodate itself to die plates of somewhat varying thicknesses.

In Fig. 49 is shown a bolster and ram into each of which the dies are screwed, being revolved by a straight wrench in holes h h', or by making the dies polygonal in shape or otherwise. Oftentimes with shanks of this kind the die U is made higher, as in Fig. 50, with a squared or hexagonal portion to the shank at s'. This construction is very common with round dies of small size, such as are used for can making, &c.

In Fig. 51 is shown a horizontal cross section, at a point just below x, of a ram like those in Figs. 47 and 48, the common form of dovetail slide bearings being embodied. This, however, is sometimes varied to some of the other forms shown in Figs. 15 to 20 inclusive. Incidentally a flange, f' f' (shown also in Fig. 54), is embodied in this ram, although it might be omitted as far as the other features described are concerned. In Fig. 52 is shown a similar section of a ram fitted with a separate clamp, as in Fig. 55, but with tap bolts to pinch it tightly upon die shank when inserted in the round hole, or punch socket, shown. In Fig. 53 is shown a modification of the latter form where the hole or socket is of rectangular form, set diagonally, the clamp being in this case mounted upon studs and tightened by nuts running thereon. This is perhaps, upon the whole, the best of all methods for holding shanks, especially when the socket is chambered out at the top, as at x, Fig. 55, so that if desired the shank can have a flange or projection entering into this chamber, and thus be held against any downward pull caused by stripping, &c. Such a socket will at the same time hold flangeless shanks just as well, and will accommodate those of round, round slightly flattened, octagonal or square sections. Furthermore the size of these shanks need not be accurate, as the clamp can be screwed up to various points in its path so as to grasp sizes of somewhat varying diameters.

Fig. 54 shows at L an extra large and heavy lower die, intended to be bolted directly to press bed without a bolster, also an upper die which is perfectly flat on the top and is secured to ram R by tap bolts through flanges f' f' (shown also in top view at Fig. 51) which are provided thereon. This is an excellent method for large cutting dies which might slightly shift in a rotary direction, on a vertical axis, if fastened with a shank only. Sometimes, however, they are secured with both shank and tap bolts.

In Fig. 55 is shown a bolster, B, to which is fastened a chuck, C', by means of countersunk tap bolts, although it might be fastened in various other ways, or might even be a part of the bolster itself, as in the next figure. In this chuck is secured a small cylindrical disk or ring shaped die, L, by means of a set screw. This is a common form, especially where there happens to be a large number of small dies which are of the same size outside, it evidently being much cheaper to mount them all in a common chuck in this way than to provide each one separately with a plate of its own. At C is shown an upper chuck, secured in the ram R by the method previously mentioned in discussing Fig. 53, although such a chuck may be mounted according to any of the systems above described. It is shown that upper die U is secured by a pointed set screw entering its shank, which latter, however, might be either tapering, as in Fig. 47, or screwed, as in Fig. 49. The same reasons in favor of the chuck system apply here as have just been mentioned for the lower die.

In Fig. 56 is shown another chuck system in common use, where the lower die L is dovetailed into the chuck B, which in this case is shown as made in one piece with the bolster, although it evidently might be separate, as in Fig. 55. The upper die U is shown as secured to the ram by the same dovetailed method, although when such dies are small they are sometimes dovetailed to an upper chuck, which is fastened to the ram by any of the methods shown. As here given, these dies are gripped by a wedge shaped gib, W, and also by set screws bearing thereupon. These set screws are, however, generally omitted, dependence being placed upon the wedge alone. In some cases the wedge is omitted, the set screws alone doing the work. In Fig. 57 is shown at B another form of bolster chuck, which is also represented in top view at Fig. 58. In this case the dies fit loosely inside of an upwardly projecting ring upon the chuck (or its substitute, four or three separate lugs) carrying the set screws shown. Such a die may be varied in position by running each set screw in or out to a more or less amount. It is one of the oldest methods for gripping dies, and is still used in many cases, but more especially upon drop presses where the die is solid and heavy and there is no other method provided for adjusting it laterally in place. It is, however, very objectionable for thin, ring shaped dies for accurate cutting or forming work, as the die itself is generally sprung more or less out of its normal shape by the pressure of the screws. In this case the upper chuck is shown as a shank, provided with an enlarged screw thread at its lower end, upon which a gland, g, is screwed. The

gland forces the upper die U upward by means of its conical head, and at the same time holds it rigidly in lateral direction. This form is much used for round punching work not exceeding 2 inches or 3 inches in diameter, and is very convenient and cheap, as the punches themselves, which have to be frequently renewed, are of the simplest possible form.

In Fig. 59 is shown a pair of shear blades, the lower one, L, fastened to a chuck, C', or in some cases to a bolster of similar shape, or in still other cases to the bed of the press itself, as made especially to receive it. At U is shown the upper blade, fastened directly to the ram, although in some cases an upper chuck is used. Two ordinary methods of fastening are shown, the upper one consisting of tap bolts

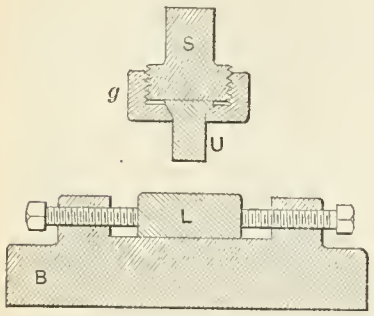
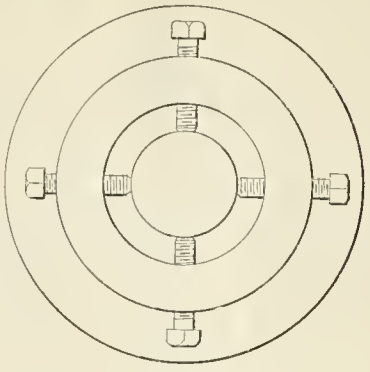


Fig. 57.



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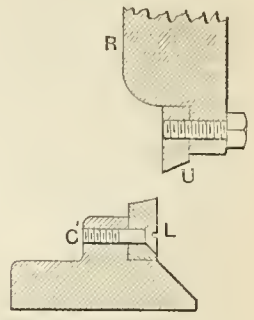
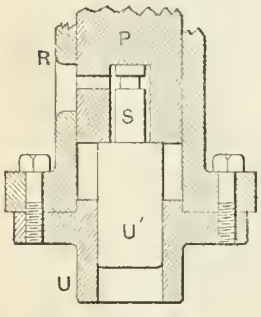


Fig. 59.



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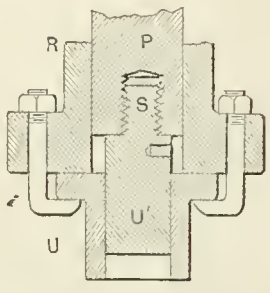


Fig. 61.

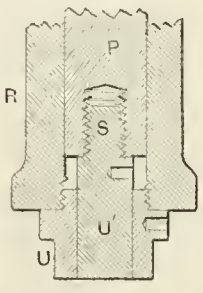


Fig. 62.

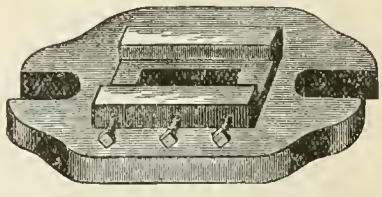


Fig. 63.

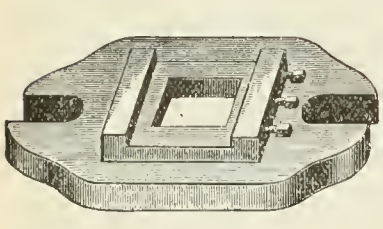
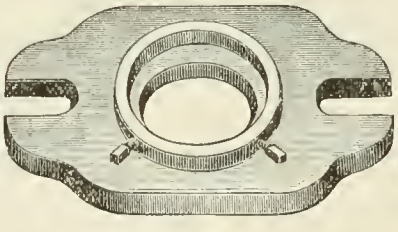


Fig. 64.



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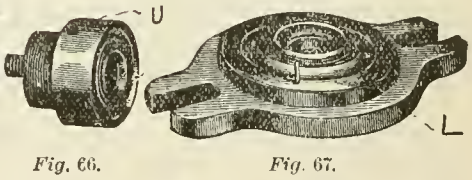


Fig. 66. *Fig. 67.*

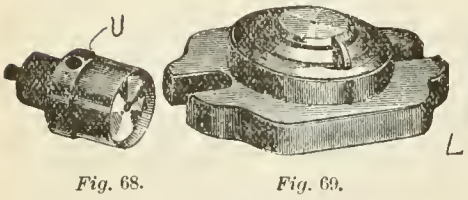


Fig. 68. *Fig. 69.*

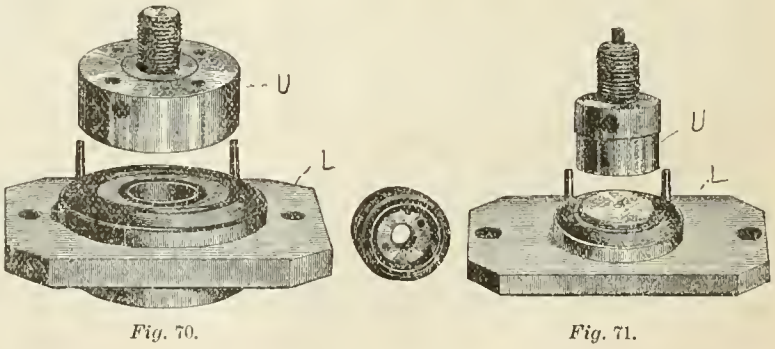


Fig. 70. *Fig. 71.*

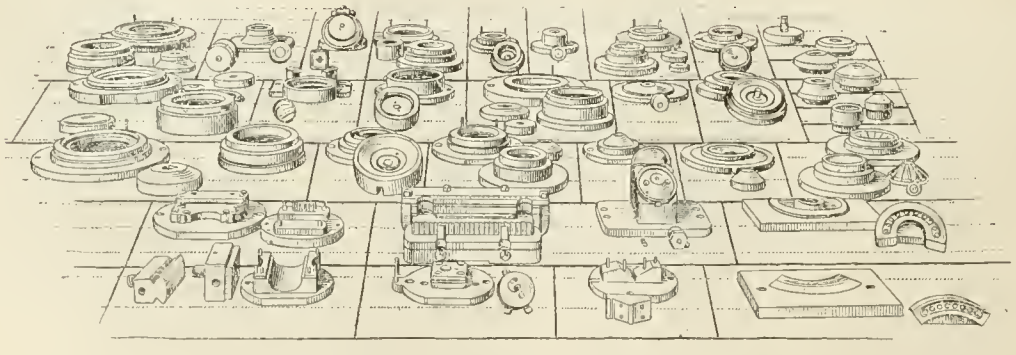


Fig. 72.

PRESS WORKING OF SHEET METALS.

tapped into the blade itself, and the lower one of countersunk screws through the blade. In some cases such screws are made longer and mounted with nuts, instead of screwing directly into the chuck.

At Fig. 60 is shown one of the common methods of fastening double action dies, for drawn work, to the ram of a double action press, R, which is usually provided with projecting flanges through which tap bolts run down into

In Fig. 61 is shown a die not guided by a tenon, but resting with its flat surface against ram R, being secured by sliding hook headed clamps. The inner die U' is screwed into the plunger, the same as in Fig. 49, and the outer die is supposed to find i's own position before being clamped to place. In Fig. 62 is shown the same arrangement as regards plunger, but with a threaded socket in ram, into which upper die is screwed. Sometimes a chuck, the upper part of which is fitted to ram in the same manner as is the die itself in Figs. 60 or 61, is used, thus getting the advantage of one chuck which will answer for several small dies. The lower dies are not shown in the last three figures mentioned, as they are fastened by some of the various methods shown for single action dies.

dies) capability of revolving the dies about their vertical axis to various desired positions in the ram or upper chuck and below, either directly upon the bolster or by revolving the bolster itself, or any lower chuck that may be used. 4. Interchangeability, as previously referred to. 5. Cheapness of design in one or both dies. There are in common use various methods besides those shown, which, however, will give a general idea of the most usual methods

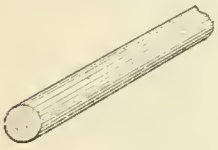


Fig. 73.

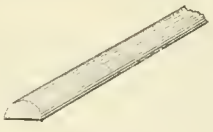


Fig. 74

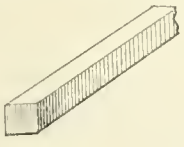


Fig. 75.

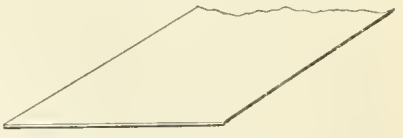


Fig. 76.

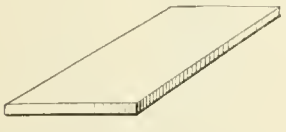


Fig. 77.

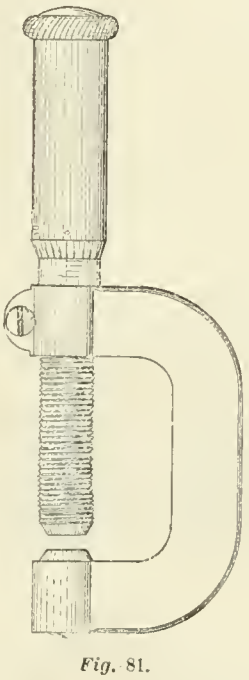


Fig. 81.

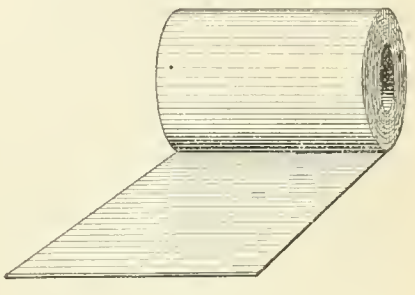


Fig 78.

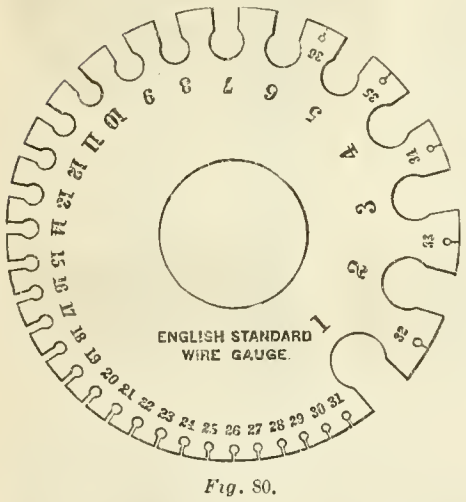
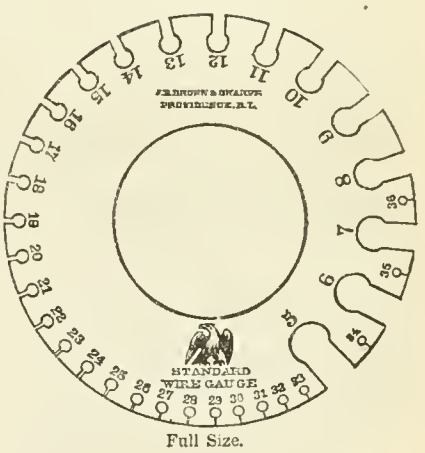


Fig. 80.



Full Size.

Fig. 79.

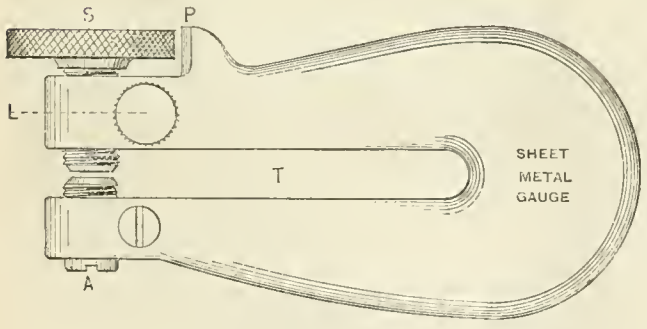


Fig. 82.

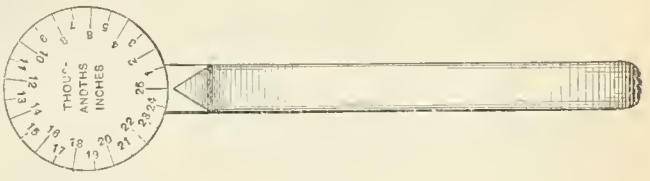


Fig. 83.

PRESS WORKING OF SHEET METALS.

the flanged upper die U. As shown, this die is centered by a tenon projecting upward into the ram, the bolts being somewhat loose in their holes. The inner upper die (sometimes called a drawing punch) U' is shown as fitting and guided by the interior of the die U. Its shank at *s* is shown as fitting loosely in plunger P of press, so that if there are any inaccuracies due to wear or other causes, it may be rigidly kept in alignment by the die itself. A common method of holding U' from dropping out of plunger embodies a small bolt or other device not here shown, engaging in an annular groove running around *s* near its upper end.

The fastenings for upper and lower dies, as shown in the various pictures, do not necessarily go together respectively, as, for instance, the lower die in Fig. 47 might accompany the upper die in Fig. 48 or 49, &c.; and almost any of them could be freely changed about at will. Hereafter in this treatise the simple form of upper and lower dies shown in Fig. 48, each consisting of a small cylinder surmounting a large one, will be used, wherever suitable, as a conventional diagram representing a pair of dies.

Accuracy and Durability of Dies.

In making or purchasing dies, after considering what general mechanical

forms as above mentioned are best suited to his case, the die user should pay especial attention to getting the proper —not necessarily high—degree of accuracy and durability to suit his particular work. In some cases the accuracy must be very great, as, for instance, where certain pieces of work produced by various dies must assemble together and properly fit each other. In this case durability of certain working surfaces is very necessary in order that the sizes dependent thereon should be maintained as nearly uniform as possible. In other cases accuracy is not necessary, as, for instance, with various kinds of ornamental work, where mere appearance is the chief desideratum. Such dies may, perhaps, be required to have certain surfaces durable for the sake of maintaining the proper artistic effect or of avoiding wrinkles, &c. In other cases, however, there may not be any good reason for special durability, except avoidance of too frequent repairs or renewals. How frequent is a matter which depends wholly upon the required production. If, for example, only 1000 pieces of a certain soft brass ornament are wanted in a year, as is the case in some gas fixture manufactories, it would be foolish to make accurate hardened steel dies, because dies of the softest, cheapest material would run without any apparent wear for the hour or two required to make this quantity.

If, on the other hand, these dies were required to run every day and all day, making many millions of pieces each year, then the greater the first cost, with its consequent durability, the cheaper as a rule the dies would be in the long run.

In Figs. 63, 64 and 65 are shown perspective views of various lower chucks. In Figs. 66, 67, 68, 69, 70 and 71 certain forms of fruit can dies are pictured, this whole group, as well as the above mentioned chucks, being assembled at random from cuts in the catalogues of various die manufacturers. They are given here simply to show some of the designs in practical use—not necessarily as things of beauty and joys forever.

In Fig. 72 is shown in one group a complete set of dies for manufacturing such parts as could be made with dies of a certain design of lantern, used by one of our large railway companies. They are given merely as an illustration of the appearance such tools may assume in practice, and to give an idea to the uninitiated of the large quantity of dies required to produce a comparatively simple looking article. Such a group represents a great many hundreds of dollars for the actual cost of the dies included therein. Each pair of dies, nevertheless, will cheaply produce millions upon millions of pieces, all practically alike.

Materials.

Having analyzed to some extent the tools used in the art of sheet metal working, of which we are treating, it may now be well to glance at the general nature of the materials worked upon by these tools. Although my title speaks of sheet metals as the general name for these materials, I must qualify the term somewhat by including certain forms of bar metals. This is not really changing the subject, for it is difficult to make a logical distinction between a sheet and a bar; and, furthermore, as a practical matter, the same presses and dies are often called upon to work both of these forms. Neither will the remarks to follow in the various succeeding chapters always limit themselves entirely to metals, as in some cases other certain non-metallic articles in the forms of sheets and bars are treated by the presses and dies in question in an exactly similar manner to the metallic ones.

In Figs. 73 74, 75 and 76 are shown a few of the various forms of bar metal in common use, their cross sections being circular, semi-circular and rectangular respectively. In Fig. 77 is shown a sheet of tin plate and in Fig. 78 a roll of sheet brass. These latter, and in fact all sheet metals, are obviously but very thin, wide bars, and there is, therefore, no vital distinction between them and any other flat bar; like Fig. 76, the difference being only in degree and not in kind. As a practical matter we shall find that such bars as are here shown (and others) are frequently worked in the same machinery as are the sheets, which differ from them only by being thinner and wider in their general proportions.

The commercial names of these materials are too well known to need much comment here. In this country and in Great Britain the English inch, and the fractions thereof in common use, are, I believe, always used to designate bar iron, steel and copper, as well as the larger sizes of brass. Thus, for instance, bar iron is known as ¾-inch round, 1-inch square, 4 x ½ inch, &c. The wider bars, usually called plates, such as are used for boiler making, shipbuilding, &c., are also usually designated by their width and thickness in inches. When, however, round bars become so small as to be called wire, which is usually under ½ inch in dismeter and of a length sufficient to coil, and when sheets become too thin to be described by ordinary inch fractions, then trouble commences. This trouble arises from the innate foolishness of the human heart, which cleaves to that which is old, no matter how absurd, and hesitates long about adopting the new, however permeated with common sense.

Gauges.

These remarks refer to the vexed question of the so-called wire gauges, which might occupy the whole of my available space were I disposed to go into it. It is enough to say that the various dozen or two gauges in common use are all ridiculous and are founded upon no scientific system whatever. They are, moreover, extremely inconvenient and are somewhat confusing on account of the smaller numbers representing the thicker metals. I will not here attempt to designate the actual thicknesses represented by the numerous host of gauges, such as old English, Holtzapfel's, Lancashire, new English, imperial standard, Prentice, Trenton, Washburn, music wire, rivet, hoop iron, machine screw, and, worst of all, the last absurdity recently adopted by our American Congress wherein the lowest number, for the thickest metal, is written with seven ciphers in a row. How these are pronounced I do not know. Neither can I imagine who will ever take the trouble to count them. It will be sufficient here to give the value in thousandths of an inch of three gauges, which are in the vast majority of cases in actual practical use, viz.: 1. The Birmingham or Stubs' gauge which is almost always meant when sheet iron or steel, or galvanized sheet iron, or iron wire is referred to and sometimes also brass and copper wire. 2. The American or Brown & Sharpe gauge, which is usually meant when sheet brass or copper is spoken of and sometimes wire of these materials also. 3. The so-called zinc gauge, which may or may not be meant when that metal is referred to by number. These measurements will be found in the table below, but it must be remembered that there is no certainty, when anybody orders a certain number of metal, as to what gauge he means; and, furthermore, that the notches of the so-called wire gauges in common use are continually wearing and becoming all the time more inaccurate than they were at first; and also that people who sell metals usually work with such worn gauges.

Number of wire gauge.	American, or Brown & Sharpe.	Birmingham or Stubs'.	Zinc.
0000	0.46	0.454	.....
000	0.40964	0.425	.....
00	0.3648	0.38	.....
0	0.32486	0.34	.....
1	0.2893	0.3	0.002
2	0.25763	0.284	0.004
3	0.22942	0.259	0.006
4	0.20431	0.238	0.008
5	0.18194	0.22	0.01
6	0.16203	0 203	0.012
7	0.14428	0.18	0 014
8	0.12849	0 165	0.016
9	0.11443	0.148	0.018
10	0.10189	0.134	0.02
11	0.090742	0.12	0.024
12	0 080808	0.109	0.028
13	0.071961	0.095	0.032
14	0.064084	0.083	0.036
15	0.057068	0.072	0.04
16	0.05082	0.065	0.045
17	0 045257	0.058	0.05
18	0.040303	0 049	0 055
19	0.03589	0.042	0.06
20	0.031961	0.035	0.07
21	0 028462	0.032	0.08
22	0.025347	0.028	0.09
23	0.022571	0 025	0.1
24	0 0201	0 022	0.125
25	0.0179	0.02	0.25
26	0.01594	0 018	0 375
27	0.014195	0.016	0.5
28	0 012641	0.014	1
29	0.011257	0.013	.....
30	0.010025	0.012	.....
31	0 008928	0.01	.....
32	0.00795	0.009	.....
33	0.00708	0 008	.....
34	0.006304	0.007	.....
35	0.005614	0.005	.....
36	0 005	0.004	.....
37	0 004453	.....	.....
38	0.003965	.....	.....
39	0 003531	.....	.....
40	0.003144	.....	.....

Besides the two distinct names given in the table above for the Birmingham gauge, it is often spoken of as B. W. G., and also as the English gauge or the English standard wire gauge. These latter names are evidently misnomers, because there are several other English gauges. In Fig. 80 this gauge is shown, full size, as often made, its thickness being in the neighborhood of ⅛ inch. It will be noticed that its misleading name is stamped upon it. In Fig. 79 is shown the American gauge, whose accuracy, when new, can be depended upon if stamped with the maker's name, as shown in cut. No picture is here given of a zinc gauge, as it does not seem to be an article readily procurable in the market, and probably does not often have its portrait taken.

In addition to the "pure mongrel" methods of measuring just referred to there are other interesting systems in common use. One of these is that employed by makers and users of tin plate, where the thickness of the sheets is defined with a delightful uncertainty by the use of the word "taggets" to denote a thickness of anywhere from 0.004 inch to 0.008 inch, averaging, perhaps, 0.006 inch; of "IC" to denote from 0.010 inch to 0.014 inch, averaging about 0.012 inch; of "IX" to denote from 0.013 inch to 0.017, averaging about 0 015 inch; of "IXX" to denote from 0.015 inch to 0.019 inch, averaging about 0 017 inch, &c. There is no definite value that can be attached to any of these terms, and

such alleged values as they have overlap each other in a number of cases, as will be seen by the instances given above. Neither do the gauge makers supply us with any tools whereby sheets designated by these mysterious symbols may be measured. If they did the gauges would probably have to be made of india rubber.

Another yet more foolish method of defining the thickness of sheet metal is to specify the weight in pounds or ounces per some unit of surface area, as so many ounces per square foot, &c. The solving of such puzzles as are involved in measuring operations of this kind requires either long experience or a mathematical mind of a high order.

Under existing circumstances the only sensible method for measuring sheet metals and wire is by a micrometer caliper such as is easily obtained in open market in the form shown in Fig. 81, or in a yet more convenient form, as far as thin metals are concerned, as depicted in side view in Fig. 82, and top view in Fig. 83. This is a design contrived by the writer for a gauge to be carried in the vest pocket, and to be instantly read without the calculation required in Fig. 82. It is not patented, and it is to be hoped that some gauge maker will recognize its good points, if it has any, and put it upon the market.

The subject of establishing one gauge which shall be universally used, in all English speaking countries at any rate, is now exciting considerable attention in the various engineering societies, and is under consideration in a committee recently appointed for the purpose by the A. S. M. E. The writer has for some years past, in various publications, earnestly urged the adoption of a gauge which shall simply agree, as far as it goes, with the micrometers just mentioned. In brief, it would consist for each particular trade or business of a plate containing such notches as were most convenient for that trade, each one being known by that number representing the number of thousandths of an inch which measured it. Thus the notches in any given gauge could be of any size required, and as few in number as possible. The various gauges made would always agree where they happened to contain similar numbers, and yet the largest latitude could be used in accommodating them to their special purposes. The writer recommends that this gauge be of an elliptical shape, to distinguish it from the various round and octagonal shapes now on the market, and that some enterprising manufacturer shall aid in introducing so useful an engineering tool by the simple process of introducing it. There is no question but what it would take care of itself as far as staying introduced was concerned. It would be well to have all forms of this gauge contain some simple symbol, such, for instance, as M G, meaning thousandths gauge, by which name it might appropriately be known.

The last of the students' gatherings which have enlivened the course of training this year at the New York Trade School was held on Tuesday evening. Addresses were made by Walter Reid, ex-president of the Master Painters' Association, and by John Mitchell, vice-president of the National Association of Master Plumbers. A number of prominent tradesmen and a large attendance of the students formed an attentive audience.

There are two manual training schools in operation in Japan.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

Higgins & Co., 379 Lexington avenue, New York, installed one of the first of the new No. 377 Richmond sectional steam heaters in the large club house of the Bay Ridge Club, at Bay Ridge, L. I. The circuit system was employed and the plant has been successfully tested.

G. S. Blodgett Company, Burlington, Vt., have nearly completed the plumbing and heating of the barracks, guard house and hospital at Fort Ethan Allen, near Burlington. A Dunning steam boiler will be used in the barracks, and an American Boiler Company's Perfect hot water heater in the hospital.

Benjamin F. Shaw, Wilmington, Del., hss received the contract for the plumbing and steam fitting to be done at Gordon Heights by the Wilmington Steamboat Company.

Architect Eisenman of Cleveland, Ohio, has about completed plans and specifications for the steam heating, wiring, piping, plastering, &c., of the State Masonic Home at Springfield. These plans will be submitted to the trustees next week, and the contracts let by April 1.

E. Baggot, 169–171 Adams street, Chicago, is to furnish the plumbing, sewerage and gas fitting for the residence of F. F. Kinney, 779 Jackson Boulevard.

The Kelly & Jones Company, 48–52 North Clinton street, Chicago, have taken the contract for the steam heating plant in the Garfield Building, Cleveland, Ohio. This building is 11 stories in hight, has a frontage of 170 feet on Bond street and 71 feet on Euclid avenue.

The Smith & Anthony Stove Company, 217 Lake street, Chicago, are to furnish 400 "Fig. II" Sanitas brass traps for the Marquette Building, Adams and Dearborn streets.

Among the contracts recently taken for steam heating by Cook & Chick, 253 Kinzie street, Chicago, can be mentioned the following: The 16 flat building of Richard Curran, 4450 St. Lawrence avenue; store and flat building of T. M. Heaney, 256–258 Kinzie street; residence of H. F. Thoma, Champlain avenue and Fiftieth street, and residences of W. F. Olin and Mrs. Mary Brabon, Edgewater, Ill.

David Ahern & Son, Fond du Lac, Wis., are to furnish Gurney heaters and necessary radiation for hot water heating plants in the Saint Mary's Academy, Saint Mary's, Wis., and the Holy Angel's Church, West Bend, Wis.

John Trainor of Linden avenue and Mosher street, Baltimore, Md , is doing the plumbing in the new Builders' Exchange building in that city. He is using 25 Acme syphon jet closets with quartered oak tanks and seats, five Demorest porcelain lined closets with oak tanks, and 50 Boston lavatory wash basins in pink Tennessee marble slabs. All fixtures are locally vented to a heated stack, and countersunk Tennnessee marble floor slabs are used for all fixtures, safety wastes, &c.

The Baker & Smith Company, 193–197 Van Buren street, Chicago, are to install a hot water heating plant in the residence of E. Frankenthal, Michigan avenue and Thirty-third street.

E. Baggot, 169-171 Adams street, Chicago, is to supply additional plumbing in the Wollensak Building, Washington and Clinton streets.

Chas. H. Graves, 62 North Clark street, Chicago, has the contract for steam heating in the flat building of Adam Zaska, Troy street, near Twelfth. A Florida boiler will be used.

F. W. Lamb & Co., 258 Michigan street, Chicago, are placing a steam heating plant in the apartment building of A. E. Kent & Son, Calumet avenue and Forty-third street.

Peck Bros. & Co., 259 Wabash avenue, Chicago, have just furnished their Boyd lavatories, triple jet closets and porcelain baths for L. A. Norton's residence, Austin, Ill. Also the complete plumbing specialties in L. A. Mick's apartment building, Forty-fifth street and Wright avenue.

Calvin K. Austin will build a three-story apartment house at a cost of $15,000, at 1633 Roscoe street, Chicago, to be heated by hot water and supplied with gas ranges. The bathrooms will be laid in tile.

Hynes Bros. will erect a five-story apartment house, 50 x 80 feet, at 3641 State street, Chicago, at a cost of $30,000, to be heated by steam.

Peck Bros. & Co., 259 Wabash avenue, Chicago, are to furnish the plumbing goods used in the flat building 3034 Portland avenue, E. D. Connor, plumber; P. Ryan's building, 409 North Clark street, M. A. Mandable, plumber. Also in the residence of A. R. Grisevold, Princeton, Ill.

H. E. Fry & Bro. Jacksonville, Ill., have secured the contract for the hot water heating apparatus in the residence of R. F. Cassell. E. E. Butterfield, Winchester, Ill., has the contract for heating the residence of G. W. Owings by hot water. J. B. Kingsburry & Co., Osage, Iowa, received the contract for heating J. A. Smith's residence by hot water. Boilers of the American Boiler Company's manufacture will be used in filling the above contracts.

An Industrial Exhibition of Engineering and Mining Inventions and Manufactures is to be held in April and May in Birmingham, England.

An Ohio crank, Coxey by name, announces that he will lead an army of 10,000 unemployed Americans to Washington about May 1, to demand legislation for the relief of the people.

The question of the disposal of the schoolship St. Mary's, hitherto maintained by the City of New York, is again under consideration. The various chambers of Commerce and Boards of Trade throughout the State are in favor of transferring the training vessel to the State authorities, and resolutions to this effect have been largely adopted.

Edison has perfected his latest invention, the kinetoscope, an instrument by which a series of pictures can be rapidly taken of a person or object in motion, in what is practically a single picture. He has taken some perfect plates with this apparatus, which promises to mark a new era in photography.

STOVE TRADE NOTES.

The Philadelphia Stove Trade.

The stove trade in this section is extremely quiet, but the fact that it is between seasons accounts for a good deal of the prevailing dullness. While, of course, it is too early to expect any business in heating stoves, still at this season of the year cook stoves and ranges should be in moderate demand and a fair business done. It is not the case, however, this season, and orders are limited in size and small in quantity. Dealers are buying only to an extent sufficient to keep up a fairly representative stock, preferring to cover sales by small orders, and reasonably assuming that there will be no trouble in obtaining prompt shipments. Furnaces are in little better demand, but orders are mostly for future shipment and for buildings in course of construction. Orders from retailers are light and cover only immediate requirements.

There is a fair demand for summer goods, but the volume of business is not so large as might reasonably be expected for the time of year. Most of the large orders are yet to be placed and the season will necessarily be a little late, but a good business is looked for. Gas stoves and ranges will be in large demand presently, judging from the number of inquiries made in regard to them. This is mostly due to local conditions. The city of Philadelphia is now supplying gas at $1 per 1000 feet, therefore it is natural that the adaptability of gas for heating and cooking purposes should create a strong demand for gas goods.

There seems to be a difficulty experienced by nearly all manufacturers in the matter of making collections. It is freely stated that collections are now fully as hard to make as during the financial panic of last fall. It is fair to suppose that this condition in a measure explains the laxity on the part of retailers in placing orders for seasonable requirements. One of the largest houses in the trade here makes the statement that 25 per cent. of the paper accepted to cover last season's business was renewed in some form. A good deal of money is locked up in the building trade. Builders have not been able to turn over their work, and consequently manufacturers and dealers furnishing heaters have to wait for their money.

The prospects for future trade are good, stocks being low on every hand, excepting, perhaps, the stocks held by one or two manufacturers who ran their foundries last summer and fall, without curtailment of production. With the settlement of the tariff question and a resumption of business there is every probability of a good year's business being done.

Cupola Management.*—VII.

BY DR EDWARD KIRK.

Blast.

Before the blast is put on the tuyere doors are all tightly closed and luted to prevent the escape of any of the blast during the heat, and they should be examined from time to time to see that the luting has not blown out and the blast is escaping. The blower is speeded up to the full speed at once, and the full volume of blast given the cupola from the start. The old way of putting on the blast light and increasing or decreasing the blast at different stages of the heat has been abandoned by practical foundrymen, and the cupola is given the same blast from the beginning to the end of the heat. This is the only way good melting can be done in a cupola charged in the way before described. If the cupola does not work properly remedy the evil by changing the charges, but never vary the blast in different parts of a heat to improve the melting.

When the blast is first put on it is indicated by a rush of blast from the tap hole and at the charging door by a volume of dust passing up the stack. Then follows a bluish colored gas which bursts into a bluish flame as the stock settles, changing to a yellowish hot flame as the stock sinks still lower. If the stock is kept up level with the charging door in a cupola of good hight the gas does not ignite and it is the aim of the chargers to keep the stock up to this point until they are through charging. When the blast is shut off from a cupola for any cause or at the end of the heat before the bottom is dropped, one or more of the tuyere doors are at once opened to prevent gas from the cupola passing into the blast pipe, where it is liable to explode and destroy the pipe.

The full consideration of the blast for a cupola would take up more space than I care to give to the subject in this article and would lead my readers too far from the subject of working a cupola. I shall leave the subject for a more full consideration under another heading.

Melting.

Melting begins in a cupola soon after the blast is put on, and the exact length of time is indicated by the appearance of molten iron at the tap hole. When the iron is charged two or three hours before the blast goes on, and the bed is not too high, iron flows from the tap hole in from three to six minutes after the blast is on. When the iron is charged and the blast put on, as soon as the cupola is filled iron appears at the tap hole in from 15 to 20 minutes, if the bed is not too high. When the bed is too high iron melts when the surplus fuel is burned up and permits it to come down to the melting point, and it is very uncertain when melting will begin; and it is generally from half an hour to an hour before any molten iron appears at the tap hole. If iron does appear at the tap hole within 15 or 20 minutes after the blast is on, the bed is either too high or the fire has not been properly lit, and the bed is not doing its work properly.

Foundrymen differ as to the time for charging the iron before the blast is put on. Some claim fuel is wasted by lighting the fire early and charging the iron two or three hours before the blast is put on, while others claim fuel and power are only wasted by putting on the blast as soon as the iron is charged. I have melted iron in both ways, and I prefer to charge the iron from two to three hours before the blast is put on, except when the cupola has a very strong draft that cannot be shut off, as is sometimes the case when there is no slide in the blast pipe for shutting off the blast, and as air is supplied to the cupola through the pipe. When iron is charged and the cupola filled to the charging door with fuel and iron, and the draft shut off from the cupola, the combustion of fuel in the bed is very, light and the heat that rises from it is utilized in heating the first charge of iron. When the blast is put on, this charge of iron is ready to melt, and iron comes down in a few minutes. When the blast is put on as soon as the iron is charged the iron is cold, and time is required to heat it before it will melt, and the blower must be run 15 or 20 minutes before iron appears at the tap hole, and the first charge melts slower than when the iron has been heated before the blast is put on.

I think the best way is to put on the blast about two hours after the charging begins. When the blast goes on, the tap hole is open and is left open until the iron melts and runs hot and fluid from it. From 10 to 20 pounds are generally permitted to run from the spout to the floor to warm the spout and insure the iron being sufficiently hot to not chill in the tap hole after stopping in. The first iron melted is always chilled and hardened to some extent by the dampness of the sand bottom and spout, and when the work is light and poured with hand ladles, a small tap of a few ladles is made in a few minutes after stopping in and the iron used for warming the ladles and then poured into the pig bed or some chunks. In some foundries the cupola is not stopped in at all after the iron comes down. The first iron is used to warm the ladles, and as soon as the iron is hot enough for the work the molders begin pouring it. I recently ran off a heat of 31 tons in this way from a cupola for hand ladle work without using a single bod for stopping in.

When the iron is handled in large ladles a tap is not made until a sufficient quantity is melted to fill a ladle or there is a sufficient body of iron in the cupola to insure it not chilling in the bottom of a large ladle before another tap is made. When the blast blows out at the tap hole after a tap is made it indi-

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cates that the melted iron is all out of the cupola or the tap hole is too large, and the cupola should be stopped in until iron collects in the bottom, or the size of the tap hole should be reduced to prevent the escape of the blast. The size of the tap hole is reduced when it gets too large to run a continuous stream without blowing out, by stopping in with a bod of stiff clay and sand that will not cut, and as soon as the bod is set cutting a new tap hole through the bod with the tap bar. Iron should be melted hot and fast, and iron should never be drawn from a cupola for any kind of foundry work that is not hot and fluid enough to run stove plate or other light castings. Iron is not burned in a cupola by melting it hot and fast, but it is burned and hardened by melting it too high in the cupola and melting it slow and dull.

Nothing is gained by holding molten iron in a cupola to keep it hot, for it can be kept as hot in a ladle as in a cupola, and iron should be drawn from a cupola as fast as melted or as fast as it can be handled in pouring the work. If I were running a foundry I should never stop in the cupola except to get enough iron to give a gang of men a hand ladle full all around, or to remove a large ladle from the spout. When the cupola is very small and melts slowly it is sometimes necessary to stop in and collect iron in the cupola, but it is not necessary to stop in a large cupola for this purpose. If the iron is all poured with hand ladles the men should be divided into gangs, with only enough men in each gang to take away the iron as fast as melted. If this is not done and there is a large number of men the ladles get so cold between catches that they chill the iron before it can be poured, and the melter is blamed for not making hot iron.

The flow of iron from the tap hole indicates how the cupola is melting If it has been properly charged the flow will be even in quantity and temperature through the heat, except in a very long heat, when the stream will get smaller and the cupola not melt so fast toward the end of the heat. When too much fuel is used the iron melts slow and grows dull as the heat progresses. When the charges of iron are too heavy the iron is not of an even temperature through the heat, but is dull at the latter end of every charge and hot at the first of the next charge. When the charges of fuel are too heavy the iron melts very slowly at the beginning of each charge and fast at the latter end, and if the charges of iron are also too heavy the iron is dull at the latter end of the charge. If the cupola melts unevenly it is not being properly worked, and the mode of charging should be changed until it does melt evenly from the beginning to the end of the heat.

The Jesse Orr Memorial.

The memorial of the late Jesse Orr ordered by the National Association of Stove Manufacturers has just been engrossed by J. Vreeland Haring, Room 289, Stewart Building, New York City, where it was the privilege during the past week of a representative of *The Metal Worker* to examine it. The memorial is mounted in a handsome gilt frame 33 x 40 inches in size. The wording of the memorial is in script, round hand and Old English, and is admirably and artistically executed. The heading, consisting of the name of the association of which Mr. Orr was president at the time of his death, is in block letters with three banks of shading, and ornamented with scroll work in white. Directly below this is the likeness of Mr. Orr, done with pen and brush, and inclosed in a wreath of laurel. Underneath the picture, in Chinese white on a dark panel, appear the words "Jesse Orr," and at the right and left of the picture in script letters are portions of the memorial, presented at the meeting of the National Association held in Chicago last June. The matter is artistically displayed and is embellished with rococco ornamentation. The memorial is signed by the committee, consisting of W. H. Pfahler, Grange Sard and C. T. Prizer.

Acorn Stoves.

Rathbone, Sard & Co. of Albany and Chicago have just issued some circulars referring to their new goods. One is entitled "Acorn Ranges." It illustrates and describes the National Acorn six-hole range for soft coal and for hard coal, special patterns being made for each, in four sizes and all styles; the Magnet Acorn six hole range for soft or hard coal or wood, in four sizes, with square top or reservoir; the Duplex Acorn four-hole range for soft or hard coal or wood, in four sizes and square top or with reservoir; the Citizen, low priced range, for any fuel, in three sizes for five hole and two sizes for six hole; the Eureka, low priced four-hole range, for any fuel, in two sizes; the King Acorn, six hole wood range, in four sizes, with reservoir or square top; the Pacific Acorn, medium priced six-hole wood range, in three sizes, square top or with reservoir, and the Prince Acorn, four-hole wood range, in four sizes, with square top or reservoir.

A second circular is devoted to new cooking stoves, showing four patterns for coal and four for wood only, all being separate and distinct, and so graded in price and style that they form a complete line. They comprise the new Iron Acorn, for soft coal, in four sizes; the Standard Acorn, for soft coal, in four sizes; the Live Acorn, for coal or wood, in seven sizes; the Economist, for coal or wood, in four sizes; the Regal Acorn, for wood only, in four sizes; the Beech Acorn, for wood only, in six sizes; the New Loyal Cook, for wood only, in six sizes, and the Columbia, low priced cook, for wood only, in six sizes. Of these, the Standard Acorn stove is true to its name in the matter of its decorations, acorns standing out as a prominent feature, being shown not only in nickel panels, but also in the molded work.

The third circular relates solely to vapor stoves, giving particulars regarding the company's line for 1894. They offer a larger and more complete assortment than ever before, including the Tropic new process, the Tropic hot generating, the Tropic junior low and the Tropic junior high stoves. The new process stove has a sheet steel frame, handsomely japanned and decorated nickel plated mantel shelf, nickel panels and name plate, and is provided with an oven step. The tank is made in two sections to equalize the flow of gasolene and avoid uneven pressure as the tank becomes partly emptied. The needle points are of German silver and are non corrosive. Cylinder drums are of brass, with cast iron bottoms, which will not corrode or rust through. These stoves are made with either two or three burners and step. The hot generating vapor stove is the company's standard stove, of which many thousands are now in use. It is the only vapor stove with a removable cartridge in the stand pipe, covered by the company's patent and enabling the stove to be easily cleaned. It is made with a steel frame, folding oven shelf, lay down tank, hot blast tubular burner caps, handsomely decorated table and large nickel dial plate, and either two or three burners on top. The junior low stoves are made with one, two or three burners, and the junior high stoves with two or three burners.

ODD PLATES.

Stove manufacturers are looking forward with much interest to July and August of this year. Trade was so completely flattened during these months last year by the panic then prevailing that they naturally expect their records will show wonderful gains in the volume of business. Indications point to a good demand for stoves by that time, so that they are not likely to be disappointed. Panics do not occur two years in succession.

The March Brownback Stove Company, at Pottstown, Pa., resumed operations in their extensive foundry on Tuesday, March 6. The mounting department has been in continuous operation for some time past, and now the molding, finishing and other departments will be started up and run partly, if not full capacity.

Bergstrom Brothers & Co., proprietors of the Neenah Stove Works, Neenah, Wis., resumed operations on Monday, March 5, after being shut down since Christmas.

The Eclipse Stove Works of Mansfield, Ohio, have been putting in a new upright boiler, which is said to be the second one of its kind in use in that city. It is the patent of John Cahall of the Aultman-Taylor Company.

The Somerset Stove Foundry Company of Somerset, Mass., resumed operations last week after a shut down of over two months.

Cole & Cole of Omaha, Neb., expect, before the season is very far advanced, to be giving employment to a number of hands in the manufacture of their new air tight wood heater.

The Union Stove Works of 70 Beekman street, New York City, are the assignees of a patent granted February 20 to Reuben R. Finch and Thomas J. Hodgkins of Peekskill, N. Y., for a combined cooking range and gas stove. The range is provided with a boiler hole top, above which is a warming shelf supported by side brackets. The gas stove consists of two burners adapted to rest on the top of the range and is connected with the side brackets by means of links pinned to each of the ends of the gas stove. The arrangement is such that the latter may be swung up beneath the top shelf for the purpose of heating vessels placed thereon, or the burners may be used on top of the range for ordinary cooking operations. By this arrangement the gas stove is adapted for use in connection with the cooking functions of the range, or independent of it, as may be desired.

Superintendent Reilly of the Lebanon Stove Works of Lebanon, Pa., has resigned his position to accept a place with the Raymond & Campbell Mfg. Company of Middletown, Pa.

J. S. Patrick of the G. S. Blodgett Company, Burlington, Vt., has been calling on the Boston trade during the

past week in the interest of the Blodgett oven, and has placed a number of orders for a variety of goods used by his concern.

The John Torrey Mfg. Company, Portsmouth, N. H., manufacturers of Stovene, are represented in Boston by Mrs. E. T. Shaw, who is probably the first woman drummer to call on the stove trade in New England, although she is not without experience, having traveled in the West for another stove polish manufacturing concern last year. The trade accepts the innovation gracefully, and Mrs. Shaw seems to be making a favorable impression.

Josiah M. Read, 61 Blackstone street, Boston, the veteran manufacturer of the Read Regulating Check Damper, is at business again after quite a long period of sickness. Mr. Read will soon celebrate his 85th birthday, and is one of the oldest men connected with the trade in New England.

The Thomas, Roberts, Stevenson Company, Philadelphia, are inclosing in all of their envelopes used in correspondence a half tone engraving of their No. 68 Active Fortune range and testimonial letters on the merits of their Gauge Door ranges from Mrs. S. T. Rover of the Philadelphia Cooking School and L. A. Willis of the Baltimore Cooking School.

Custer & Richards of Bridgeton, N. J., have shipped a Valley Novelty range to a Belgian glassblower who returned from Bridgeton to his native country.

George M. Clark & Co., with office and factory at 149–161 Superior street, Chicago, Ill., send us a copy of their thirteenth annual greeting in the shape of an attractive catalogue of Jewel gas stoves. The line of these goods, we understand, is larger and better for 1894 than ever before, additions having been made to the No. 390 series of two large ranges, similar to Nos. 353 and 352; also three baking plates with broilers below. The manufacturers also state that the list price of Nos. 353, 352, 351 and 350 has been lowered. The goods embrace an extensive variety, all of which are illustrated and described in a manner to interest the dealer. The Jewel ranges are shown with and without waterback and with three or four burners in the top surface of the stove. Attention is given to Jewel step stoves, laundry stoves, table stoves, baking plates, tailors' iron heaters, wall ovens, the Jewel circulating water heater and connections of various kinds. An interesting feature of the work is an index giving also weights, size of connection pipe and telegraphic code words and prices.

The semi-annual meeting of the Vapor Stove Manufacturers was held early in the month at the Hollenden, in Cleveland, Ohio. The leading manufacturers of vapor goods were in attendance. The sessions were devoted to routine business.

Practically all of the Southeastern Massachusetts stove foundries have been idle for some weeks. Ordinarily at this season they have run on stock, but owing to the uncertainty of the outlook it was not thought advisable to pile up goods for future business. At Taunton, White, Warner & Co. started up on the 14th with a full complement of hands and some orders on their books, and the Taunton Iron Works Company resumed on the 13th. It is reported that the Weir Stove Company and O. G. Thomas will resume operations about April 1. An unusually large number of new styles in both ranges and parlor stoves are to be put on the market from this section for the fall trade.

The representatives of the Howard Furnace Company were summoned to the home office at Syracuse on Thursday and Friday of the past week for the second annual conference. After full consultation with the officers of the company they were entertained with a sumptuous banquet at the Yates House, which was opened by a brief address from the president, and terminated with a toast to the health and prosperity of the company. Those present were E. M. Moore, president; J. H Norton, vice-president; F. H. Moore, treasurer, and Lyman Norton, secretary; the resident officers at the home office, Messrs. Beers, Van Keuren and Ford of Syracuse, Mr. Tyler of Grand Rapids, Messrs. Healy and Stevens of the Boston office, and Mr. Wilkinson of the New York office. The occasion was one of great pleasure, and all returned to their respective duties with the determination to place the Howard furnace in the lead.

J. W. Van Cleave, manager of Buck's Stove & Range Company, St. Louis, was the recipient of a very handsome buck a few days since, which was presented to him by the traveling representatives of this house. The buck was shot in the forests of Newfoundland, and was exhibited in the World's Columbian Exposition, where it received much well merited praise. The head, with massive antlers, occupies a prominent position over the mantel in Mr. Van Cleave's office, while the hide does service as an office rug. The presentation came in the nature of a surprise to Mr. Van Cleave, and is highly appreciated by him. It is peculiarly appropriate, as all our readers are aware that the buck's head rising out of a body of water is the principal feature of the trade mark of the company.

The Peninsular Stove Company of Detriot, Mich., have brought out a new four-hole range, which is known as the Home Peninsular. It is intended for hard coal, coke, wood or natural gas, and is offered in four sizes. It has large square oven, which is not cut under the fire box, and the ventilation is referred to as being highly satisfactory. The range is made with large sheet flue, oval fire box, and fitted with duplex, draw center or flat grate, as may be ordered. The ornamentation is of an attractive character, a striking feature being the embellishment of the oven door. The company are booking sample orders, and from present indications the Home Peninsular is likely to prove very popular with the trade.

The Bussey McLeod Stove Company of Detroit, Mich., resumed operations on Thursday, March 15, with a force of nearly 250 hands; also the Chicago Stove Works, which is the company's Western plant, resumed at the same time, giving employment to a force of about 350 men.

The Durand Mfg. Company of Nedina, Ohio, have issued an interesting pamphlet of pocket size, in which attention is invited to what they designate as their Improved Kerosene Oil Queen, for which many claims are made. The company state that "combustion is effected with the aid of a round wick, but instead of the white flame from the wick, the burner is so constructed that the oil is vaporized at the edge of the wick and air supplied in proper places and quantities to make a clear blue flame of intense heat." The stove is made with two and three burners. The little pamphlet also illustrates and describes the company's Franklin heater, in which is an enlarged burner, making it powerful in operation. The device is light and mounted on casters, so that it may be readily moved from one room to another, making it especially desirable for the sick room.

The Standard Range Company of Evansville, Ind., have brought out a new line of high grade steel ranges, which are offered the trade under the name "Standard." The features incorporated are covered by letters patent, five in number. The Standard is fitted with oval fire pot, ventilated oven and draw center shaking grate, which may be removed or replaced without disturbing a bolt, screw or any part of the fire pot and without the use of a tool. The oven is ventilated, the air being thoroughly heated before entering the oven, after which it goes out through a gauze side and thence to the flue. The oven door kicker is of such a nature that the door may be opened or closed by a slight pressure of the foot downward or upward without taking the heel from the floor. The company state that they make all sizes of ranges from the smallest adapted for family use to the largest intended for hotels, restaurants, &c. The company have in contemplation a catalogue which will fully illustrate and describe their specialties, and which it is expected will soon be issued to the trade.

Southard, Robertson & Co., Water street and Peck slip, New York City, are distributing to their friends blotting pads carrying advertising matter relative to the Waldorf ranges. These stoves, made both portable form and for brick work, have right or left hand fire box for horizontal or upright boilers, skeleton or full warming closet and sifting grate. The manufacturers refer to the ranges as satisfactory bakers, easily managed, always reliable and economical in the use of fuel.

We have received an assortment of advertising matter from the Michigan Stove Company, as specimens of the material they are now supplying to their customers. One of these is a lithographed letter head, suitable for a merchant handling hardware and stoves. The lithographic design is highly artistic, and the company furnish such stationery to their agents at very low prices. Next is a recipe from "Dr. Experience," who prescribes as a cure for that "tired feeling," induced by too hard work to sell goods, that "Garlands" should be taken up as a line, with brains and push, "to be well taken and tested before shaking." Then comes a pamphlet which is a veritable hard times piece of work. It is printed on coarse wrapping paper and tied with a tow thread. There are eight pages, and they are by no means covered with reading matter. The sentences are pointed, however, and cannot fail to enlist the attention of the reader. No reference to Garland stoves and ranges is made until the fifth page is reached, when points made earlier begin to be driven home. It is a unique pamphlet, of the kind not thrown into the waste basket before careful examination.

Crinnen, Sexton & Co. are now erecting a large addition to their stove plant on Erie street, Chicago. It is a

brick atructure consisting of six stories and a basement. The offices and sample room will be located on the first floor, while the remainder of the building will be used for storage. On the completion of the building the firm will transfer to it their offices, which are now located on Lake street. It is expected that the consolidation of offices and salesrooms with the manufacturing department will enable the firm to transact their business with much greater satisfaction to themselves and their customers. The business of this house has shown steady and sometimes rapid growth, and while they have in common with other manufacturers felt the effects of the depression in business, they are putting themselves in shape to handle a much larger trade whenever the times improve and stoves begin to move as they should.

The Detroit Stove Works have nearly completed their new warehouse at 2921 to 2929 Twenty-ninth street, Chicago. They are already beginning to remove from their present quarters at 269 and 271 South Canal street, and expect to be comfortably installed in the new location by April 15. The offices will be handsomely fitted up and every convenience will be introduced for the rapid dispatch of business. Their facilities will be greatly increased. The company have put on the market within the past month a new steel range, cabinet style, which is proving very popular, although it has been but a short time before the trade. It is well designed, ornamented profusely with nickel, provided with all the latest improvements, and is sold at a moderate price. They are making a new departure this year in taking up gas goods. Their first venture in this line will be a gas range, which will be ready shortly. It will no doubt be a fine piece of work to sustain the reputation of the company in the regular stove line. B. W. Dodson, vice president and Western manager, is now in California, enjoying a brief respite from business cares, to be gone for perhaps a month.

Rathbone, Sard & Co.'s stove foundry at Aurora, Ill., is running full time and has not been shut down during the past 12 months at any time except for a brief period when inventorying. Conditions have been such for the past year that the company have found it advantageous to concentrate their work at Aurora, instead of dividing it between the Aurora and Albany works. Thus the Aurora plant has been enabled to run full time, making Aurora one of the best towns for stove workmen in the country.

The Excelsior Steel Furnace Company, 36 Monroe street, Chicago, report an improved demand for furnace fittings and furnacemen's supplies. Their ready made stacks, elbows, boots and heat pipes are working their way into the favor of the trade, and will this year be used by many more furnacemen than ever before.

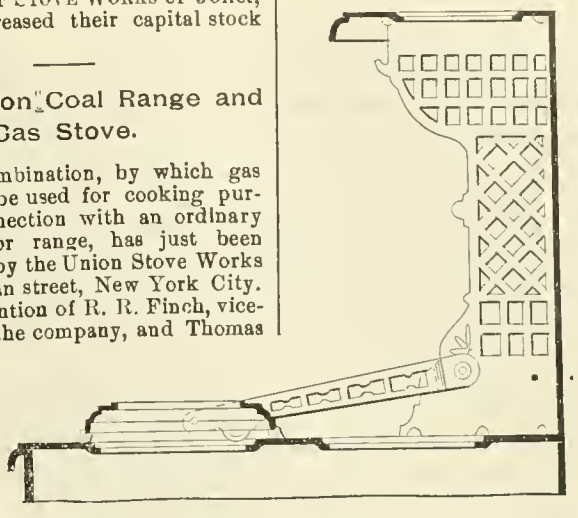
The Midland Steel Company of Muncie, Ind., for whom James W. Ross, 647 The Rookery, Chicago, is sales agent, are now making smooth sheet steel for stove bodies. These sheets are pickled and cold rolled, and are finished with a beautiful surface of an even color.

At a recent meeting of the stockholders of the Co-operative Stove Company of Blooomington, Ill., it was voted to increase the capital stock to $50,000. During the past year the company have enjoyed a good business and the stockholders are said to be well pleased with the condition of affairs as shown by the report presented. A new range has just been brought out, for which a popular demand is expected to develop.

The Joliet Stove Works of Joliet, Ill., have increased their capital stock to $100,000.

Combination Coal Range and Gas Stove.

A novel combination, by which gas burners may be used for cooking purposes in connection with an ordinary coal stove or range, has just been brought out by the Union Stove Works of 70 Beekman street, New York City. It is the invention of R. R. Finch, vice-president of the company, and Thomas H. Hodgkins, their pattern maker. It is designated as a combined cooking range and gas stove, and is so constructed that the gas burners may be used independently for ordinary cooking purposes, or they may be swung up under the high shelf of the range to keep dishes hot, while the top surface of the range is being used for the discharge of its usual functions. The illustrations which we present herewith convey a good idea of the manner in which the burners or gas stove, as it is called by the makers, are arranged. Fig. 1 represents a section through a burner as it appears resting on the top surface of the range, and also through the high shelf supported by brackets used in connection therewith. Fig. 2 shows the burners swung up immediately beneath the high shelf, and clearly indicates the manner in which they can be utilized for heating vessels placed thereon. The burners are two in number, and when in position on top of the range or stove are over the front boiler holes. They are firmly connected by an intermediate web of metal, while at the outer side of each of the burners is pivoted a link bar, having its opposite end pivoted to one of the side brackets of the stove, as shown in Fig. 1. In the front edge of each of the side brackets is a recess, while on each end of the gas stove or burners is a pin which enters the said recess, and in connection with the link bars holds the burners in place when they are swung up from the top of the range under the high shelf. In the latter are two pot holes or openings into which fit kettle rests that are upcast so as to project slightly above the top surface of the warming shelf. This keeps the vessels placed thereon far enough away from the top and the gas jets to allow of free combustion of the gas. When it is desired to use the combined functions of the range and gas stove, the latter, by means of its link connections with the side brackets,



Combination Coal Range and Gas Stove.—Fig. 1.—Sectional View, Showing Gas Burners Resting on Top of Range.

is raised so as to rest beneath the high shelf, with the gas burners beneath the pot holes into which are fitted the kettle rests referred to. The appearance of the device is then as represented in Fig. 2. When it is desired to use the gas stove alone it is swung down so as to rest on the boiler hole top of the range, with the parts appearing as in Fig. 1. When a large amount of cooking is to be done the combination arrangement can be employed,

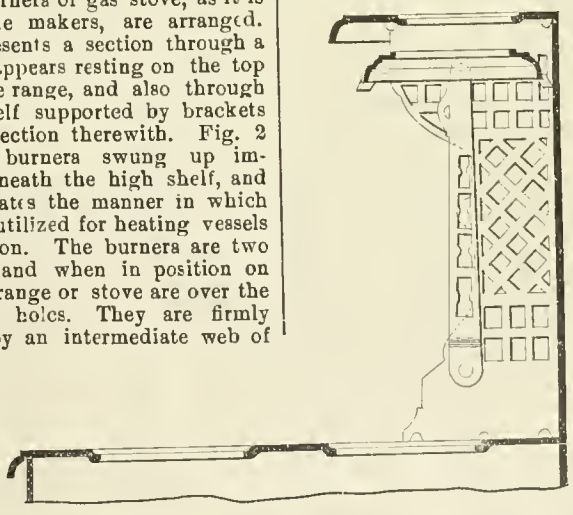


Fig. 2.—Appearance of Gas Burners when Swung Up Beneath the Pot Holes in High Shelf.

while in the summer months of the year it will be found convenient to use the gas burners independent of the range.

The Johnston Steamship Company of Liverpool have completed arrangements for the establishment of a line of whaleback steamers, to run between Baltimore and Tampico, Mexico, in connection with the Baltimore & Ohio Railroad. The service, which is to commence on April 18, will prove of great importance to Chicago, Pittsburgh, Cincinnati, Columbus, and the coal and coke regions of Pennsylvania, Maryland and West Virginia.

TRADE REPORT.

The Iron Market.

The market shows no decided change, and although the trade hope for the best there is but little chance of improvement until the tariff is settled. The bright springlike weather is having a good effect, and while nothing heavy is looked for, it is hoped that there will be at least the usual increase in the volume of business which is looked for during the spring and summer months.

Pig Iron.—Business in the New York market is light and no sales of consequence are reported. As showing how keen competition is, the fact is instanced that an order for 1000 tons No. 2, delivery Hoosick Falls, N. Y., was captured by a Virginia furnace. No contracts of any magnitude for Cast Iron Pipe have been placed lately. A very large order is, however, soon to come into the market. We quote standard brands $13 @ $13.50 for No. 1; $12 @ $12.50 for No. 2, at tidewater. Southern Iron, same delivery, $12.75 @ $13.25 for No. 1; $11.25 @ $11.75 for No. 2; $11 @ $11.25 for No. 3; $11.25 @ $11.75 for No. 2 Soft, and $11.75 @ $12 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10 50 @ $11.

Philadelphia advices intimate that sellers in that district claim to be finding a somewhat better demand, and notwithstanding the increased production, say they are placing all their output without making any sacrifice in prices. This may possibly be the case, temporarily; but so far as reports from consumers go, it is difficult to find anything to confirm the statement that business is actually larger than it has been at any time since the beginning of the year. Nevertheless, there is a general testimony from sellers that they can move more material at full prices and with less pressure. The trade feel very much encouraged, and it is hoped that before the end of the month the results will show that their ideas are well founded. Meanwhile sales are chiefly at figures quoted below for Philadelphia and near by points, but with a marked tendency to get away from the inside figures:

No. 1 Foundry	$13.00 @ $13.50
No. 2 Foundry	12.25 @ 12.75

Local Irons have been in moderate demand in the Chicago market, with no heavy transactions. Dealers state that under existing conditions it is perhaps better not to make long time contracts, because they simply lead to dissatisfaction as long as prices continue to decline. Sellers of Southern Irons generally report a very quiet trade; sales still confined to Soft Iron. Lake Superior Charcoal is moving in carload lots only. Prospects in a general way are looking up for an increased volume of business. The local foundries are doing more from week to week, although their orders are of a small character, seldom calling for more than a few columns and for small store fronts, &c. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @ $15.25
Local Coke Foundry, No. 1	12.00 @ 12.50
Local Coke Foundry, No. 2	11.50 @ 12.00
Local Coke Foundry, No. 3	11.00 @ 11.50
Local Scotch	13.00 @ 13.50
Ohio Strong Softeners No. 1	13.50 @ 14.50
Southern Silvery, No. 1	..... @ 12.50
Southern Silvery, No. 2	..... @ 11.75
Southern Coke, No. 2	11.25 @ 11.50
Southern Coke, No. 3	10.75 @ 11.00
Southern, No. 1, Soft	11.25 @ 11.50
Southern, No. 2, Soft	10.75 @ 11.00
Tennessee Charcoal, No. 1	15.50 @ 16.00
Tennessee Charcoal, No. 2	15 00 @ 15.25
Alabama Car Wheel	18.50 @ 18.65
Jackson County Silvery	15.00 @ 16.00
Other Ohio Silvery	13 00 @ 13.50

Makers of Pig Iron in the Pittsburgh district appear to have renewed confidence in the future of the market, judging by the way idle stacks have been going in during the present month. This means a very large increase in production, but it is believed that demand will soon show substantial increase. The product of Pig Iron in Allegheny County is now very close to capacity. Foundry Iron is moving only in small lots and prices are weak. We quote as follows:

No. 1 Foundry	$11.50 @ $11.75 cash
No. 2 Foundry	10.50 @ 10.75 "

In Southern markets there has been some increase in the demand for nearly all grades of Pig Iron during the week. Not that there were any round lots wanted, for either spot or forward delivery, but there was an increased number of small orders running from one to ten carloads, which in the aggregate make a larger volume of business than has been experienced for some weeks. The demand was largely for No. 3 Foundry and No. 2 Soft. No. 1 Foundry and No. 1 Soft was offered in excess of the demand, and some deliveries of No. 1 Soft were made on contracts for No. 2 Soft. There were sales of Charcoal Car Wheel Iron to a moderate extent and there are ample offerings at somewhat lower prices. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$11.00 @ $11.25
Southern Coke, No. 2	10.00 @ 10.25
Southern Coke, No. 3	9.50 @ 9.75
Ohio Soft Stone Coal, No. 1	14 50 @ 15.50
Ohio Soft Stone Coal, No. 2	14 25 @ 14 50
Lake Superior Coke, No. 1	13.00 @ 13.50
Lake Superior Coke, No. 2	12.00 @ 12.25
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.50 @ 14.00
Tennessee Charcoal, No. 2	12.50 @ 13.00
Standard Southern Car Wheel	16.75 @ 17.75
Lake Superior Car Wheel and Malleable	16.50 @ 17.00

Metal Market.

Pig Tin.—From the extremely low price touched last week there has been a reaction of nearly 1¢ per pound. During the period covered by the report in our last issue, as low as 18.25¢ was quoted. During the past few days bids of 19.15¢, net cash, for 5-ton lots, prompt or near future delivery, have been made and rumor has it that a few sales were quietly made at 19.20¢ @ 19 25¢. Despite this sharp movement in prices, speculation has not enlivened in the slightest degree; at least not on the Exchange. For that matter, the leading operators there have acted as though they were content with making official quotations and dealing out Tin in a jobbing way at corresponding prices. Purely speculative sentiment, however, would seem to have recovered from the shock given by tariff uncertainties and the depression in silver, but despite this circumstance and the advance that has taken place of about £3 per ton in London quotations the tendency to venture has been remarkably tame. This encourages the idea that the market is being manipulated, chiefly for the purpose of facilitating the distribution of Tin that has arrived since the duty of 4¢ per pound went into effect. How near the various theories may be to facts is problematical, but not a few distributors stated that their sales have increased to an encouraging extent since prices turned for the better. Consumers are said to be buying a little more freely, and inquiries have increased to some extent. Jobbers' prices for small lots are inclined to greater firmness at outside quotations.

Copper.—Purchases by home consumers have been on a somewhat more liberal scale; that is to say, the volume of business shows improvement as compared with the average of the preceding two or three weeks. No large individual transactions have taken place, however, and it is the general report that the deliveries called for have not exceeded 30 days. In fact, the bulk of the business has been for practically prompt delivery. Prices have undergone no radical change, but are still somewhat irregular. Lake Superior Ingot went at 9⅝¢ in lots of 25,000 to 50,000 lb, and any higher rate seems quite exceptional at the moment. Electrolytic is held at 9⅜¢, and casting brands at 9¼¢, but business has been effected very recently at concessions of ⅛¢ or more. The consumptive demand is said to be rather more active; that is to say, small orders are more frequently repeated

than has been the case for some weeks, and there is a moderate increase in inquiries. Jobbers' prices remain unchanged at former quotations for both Ingot and Manufactured Copper.

Pig Lead.—The market has developed a fairly strong tone and the improvement in that particular has been accompanied by a larger volume of business, with a little speculative interest besides. Of round lots there were sales aggregating 750 tons or more at 3.30¢ @ 3.35¢, and a number of single carload lots went at from 3.32½¢ up to 3.40¢ on the spot. The higher figures prevailed at the end of the week, with offerings moderate of stock for delivery before May, and spot supplies lighter than usual at this season of the year. In retail business no appreciable activity has yet developed. Purchases by consumers are still confined to absolute needs. Prices for small lots have not been advanced over last week's quotations despite the advance in wholesale price of the metal. The continued dullness in the building trades still serves to repress the demand for Manufactured Lead.

Spelter.—There has been hardly any business here except in single carload lots and not a great deal of that. The demand has continued very tame also, and, as far as New York is concerned, no improvement can be noted over the conditions that prevailed a week ago. Ordinary Western brands are still quoted at 3.85¢ @ 3.90¢ here, in carload lots, and the better sorts command little if anything more than the usual premium. Small lots from store command the usual premium of ½¢ @ ¾¢.

Tin Plates.—There has been little or no change for the better in the Tin Plate market during the week. Business in both spot goods and future deliveries continues disappointing and considerably below the average for the season of the year. Large consumers seem to be working on deliveries making on back orders, and they are contracting for future shipments in a very indifferent manner. Jobbers, too, are not inclined to anticipate future wants, and are limiting their orders for imported goods to the narrowest scale. The demand for spot goods from retailers and consumers shows but little improvement. In some quarters, however, a tendency is noted to the more frequent duplication of orders, and to this extent there has been improvement; although the individual orders are usually of small proportions. The whole trade is overshadowed by the tariff bill now under manipulation at Washington. No man will take more material than is absolutely necessary while the present condition of uncertainty continues. Consequently the jobbers look for little beyond a hand to mouth trade while this matter is in abeyance. Probably the most active business doing just now is in domestic Roofing Plates, for which there is a constant current demand. In the Western States the home product is said to be monopolizing the market, and the prediction is freely made that imported Ternes will not command a market in that section of the country in a few months. Prices are, if anything, slightly lower nearly all along the line, and concessions of 2¢ @ 5¢ ℔ box on desirable orders are not hard to secure.

Sheet Iron.—Black Sheets are in somewhat better demand, but the supply is ample and competition keen, resulting in the quoting of very low prices by manufacturers and dealers. Galvanized Iron is in much the same condition as Black. New concerns are making special inducements to secure trade, and are offering material at rates which must be very close to the cost of manufacture.

Chicago Report.

Scrap.—Business is extremely dull. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	...
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	...
No. 2, such as Shovels, Hoes, &c	3.00	...
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Trade is dull and prices are weak. Carload lots of 12 net tons or over are nominally quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.50

The National Tube Works, McKeesport, Pa., are reported to have booked more orders last week than in any other week in the history of the company.

CONDITION OF THE

Hardware Trade.

MARCH BUSINESS continues in fair, but moderate volume, trade being somewhat uneven in different parts of the country and for different lines of goods. In general terms business in the East and in the Southwest is probably better than in the West or Northwest, or on the Pacific Coast. The jobbing trade are not buying freely at the present time, having sufficient stock for their immediate requirements. Current orders are received principally from the smaller buyers who are getting their assortments in shape for spring business, a matter which many of them deferred until a later day than usual. It is also noticeable that orders are increasing in frequency and are for smaller quantities than the houses have been in the habit of buying. Manufacturers, also, are receiving a good many inquiries from parties who have heretofore bought chiefly from the jobbing trade, and there is a disposition in some staple lines to give the retail merchants relatively closer prices than has been the case. This comes from the solicitude of manufacturers to secure whatever orders are going. Advices from different parts of the country indicate that there is a tendency toward cutting of prices by the jobbers; and this fact, with the concessions which are being made by some manufacturers, tends to give some irregularity to current quotations. The tone of the market is thus not entirely satisfactory and far from strong. There are, however, comparatively few quotable changes. The trade at large are pursuing a very conservative course in the matter of purchases, and it will be the part of wisdom for manufacturers to refrain from forcing their goods on the market at unremunerative prices. With the opening of spring a quickening in the demand is anticipated, and there is at the present time a fair activity in seasonable goods. The financial conditions on the whole are quite satisfactory, and collections, though sluggish, give comparatively little reason for complaint.

Advices from Chicago.—Shelf Hardware maintains its appearance of activity and further gains are reported in the volume of business. Despite the improvement, however, it is not expected that the trade of this spring will rival the record of past seasons. The gap is too large to be overcome. Staple goods are quiet and straight Hardware is not moving sufficiently well to compensate for the lack of business during the early months of the year. Tinware and House Furnishing Goods are in considerably better demand, but the country merchants continue to buy broken packages which entail very much work in making up shipments. A somewhat improved demand is noted in Roofing Plates. American brands are taking the

lead in this direction, and the prediction is quite freely made that imported plates will not control any considerable part of this territory in three or four months. The heavy Hardware trade shows decided improvement. The demaud comes from all classes of manufacturing consumers, except the carriage builders, although some contracts are now being made for future delivery to a few establishments. Collections are improving.

Notes on Prices.

Wire Nails.—The Wire Nail market continues in the improved condition which has characterized it for the past few weeks. Prices are well maintained on a basis of $1.10 for carload lots, f.o.b. mill, and it is only in very exceptional cases where the orders are particularly large and attractive that this figure is shaded, and a slightly higher price is in many cases asked by some of the manufacturers. The mills are fully occupied with orders, and the current demand is sufficient to absorb their production, thus preventing an accumulation of stock.

Advices from Chicago.—The Local Wire Nail trade is affected to some extent by the reduced freight rates from Eastern factories. An equivalent concession is being made on factory lots, which brings the prices here to about $1.15. The price at factory is maintained, as the makers are still crowded with business and it will take some time for them to work off their orders. The demand continues fair from factory, but jobbers report some falling off in the demand from the retail trade. Small lots from stock are held at $1.25.

Cut Nails.—The demand for Cut Nails is fair, but not heavy, and the market is in substantially the same condition as last week, being characterized by not quite so strong a tone as for the past month or two. The following quotations are for carload lots delivered at the points named: New York, $1.05; Albany, $1.05; Buffalo, $1.02; Harrisburg, $1; Philadelphia, $1; Boston, $1.05, and Savannah, $1.05. It is understood, however, that slight concessions are in special cases made from these figures. The price from store in New York is $1.15.

Advices from Chicago.—Manufacturers of Cut Steel Nails report this month the best for a long time. Orders are larger and specifications are being freely made, so that shipments correspond well with order books. An encouraging feature of this trade is the continued demand from localities and dealers who have not for some time been taking Cut Nails, but whose trade has been given almost entirely to Wire Nails. One of the leading manufacturers now asserts that Cut Nails have seen their worst day. Prices are unchanged at $1.05, Chicago, for factory lots, 60 cents average. Small lots from stock are selling at $1.15.

Barb Wire.—Manufacturers of Barb Wire report an excellent demand, somewhat in excess of their expectations, and the mills generally are fully occupied on orders. The market is also in a very satisfactory condition as regards prices, which are steadily maintained on the following basis: Carload lots of Galvanized Four-Point, Pittsburgh, $2.15; Cleveland, $2 20; Cincinnati or Allentown, $2.25 ; Chicago or New York, $2.35, with an advance of 5 cents per 100 pounds in less than carload lots.

Advices from Chicago.—The Barb Wire trade steadily improves. Manufacturers are in receipt of continued orders from jobbers in various localities, and jobbers also report a fair demand from their customers. There is, however, less apprehension of an advance in prices, but values will probably remain at about their present level. Car load lots of Galvanized Barb Wire are selling at $2.30, and small lots from stock at $2.40.

Roller Staple.—The I X L Wire Fence Roller Staple, manufactured by O. P. Schriver & Co., Cincinnati, Ohio, is sold at $1.50 per hundred.

Glass.—The local Glass market shows no improvement either in demand or prices over that reported in our last week's issue. Reports from Pittsburgh indicate somewhat of an encouraged feeling among manufacturers, with slightly higher quotations for small quantities. It is not believed that the new tariff measure will become a law in time to affect the price of Glass made during the present blast, and this leads some to hope for an increase in price of Glass in the near future. It is understood that the Senate bill increases the duty on Glass about 12 per cent. above that proposed in the bill reported by the House. The American Window Glass market is represented in New York by quotations of 85 and 5 per cent. discount for single, and 85 and 10 per cent. discount for double. Pittsburgh quotations are reported as 85 and 10 and 5 per cent. discount for single and 85 and 20 per cent. for double strength Glass. An increase in capacity equivalent to 32 pots is noted during the past week. While no advance in the price of Plate Glass is reported, additional factories are making preparations to resume in the near future.

Old Metals.—Dealings in Old Metals are fair; but individual transactions are generally of but small proportions. Business is, in fact, still far below the average, and buyers evince only a languid interest in these materials. Scrap Iron has reached a point at which it is hardly worth handling, and lower prices than those now ruling seem to be out of the question. Dealers' purchasing prices for Old Metals, New York delivery, are about as follow:

Heavy Copper	℔ lb	7¢
Light and Tinned Copper	℔ lb	6¢
Heavy Brass	℔ lb	5¢
Light Brass	℔ lb	4¢
Lead	℔ lb	3¢
Tea Lead	℔ lb	2½¢
Zinc	℔ lb	2¼¢
No. 1 Pewter	℔ lb	13¢
No. 2 Pewter	℔ lb	6¢
Wrought Scrap Iron, ℔ gross ton	$7.00 @	$8.00
Heavy Cast Scrap, ℔ gross ton	7.00 @	8.00
Stove Plate Scrap, ℔ gross ton	4.00 @	5.00
Burnt Iron, ℔ gross ton	3.50 @	4.00

Old Rags, Paper, &c.—Business is merely of a commonplace character, and prices are practically unchanged. Improvement is, however, hoped for from day to day, meanwhile quotations are given as follows:

No. 1 White Rags	℔ lb	3¼ @ 3½¢
No. 2 White Rags	℔ lb	2¼ @ 2½¢
Mixed Rags	℔ lb	2¼¢
Blues and 3ds	℔ lb	1 @ 1¼¢
Hard Sized White Shavings	℔ lb	2¼ @ 2½¢
No. 1 White Book Shavings	℔ lb	2 @ 2⅛¢
No. 2 White Book Shavings	℔ lb	1 @ 1⅛¢
Light Book Shavings	℔ lb	¾¢
No. 1 Mixed Shavings	℔ lb	¾ @ 1 ¢
No. 2 Mixed Shavings	℔ lb	½ @ ¾¢
No. 1 Printed Books	℔ lb	1 @ 1¼¢
Ordinary Mixed Books	℔ lb	½ @ ¾¢
Newspapers	℔ lb	2-5 @ ½¢
No. 1 Manila Paper	℔ lb	1 @ 1⅛¢
No. 2 Manila Paper	℔ lb	⅞ @ ¾¢
Bogus Paper	℔ lb	½¢
Common Paper	℔ lb	⅝¢
Straw Chips	℔ lb	½¢
Binders' Clippings	℔ lb	½ @ ⅝¢
Jute Butts	℔ lb	1⅞ @ 2 ¢
No. 1 Jute Bagging	℔ lb	1 @ 1¼¢
Mixed Bagging	℔ lb	¾ @ 1 ¢
No. 2 Bagging	℔ lb	½ @ ⅝¢
Hemp Twine	℔ lb	2 @ 2¼¢
Manila Rope	℔ lb	2¼ @ 2⅝¢
Jute Rope	℔ lb	1½ @ 1¾¢
Mixed Rope	℔ lb	¾ @ ⅞¢

Old Rubber.—There is very little doing in Old Rubber, and prices remain at the low level they have held for some time past. The following quotations represent about the rates paid in New York.

Car Springs, ton lots, ℔ lb.	.... @	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.	.... @	.03
Rubber shoes, less than carloads, ℔ lb.	0.02¼ @	.03⅛
Large Hose, ℔ ton	.... @	9.00
White Wringer Rolls, ℔ lb.	.... @	.04¼
White Syringes, ℔ lb.	.... @	.05

Trade Notes.

The Oil Well Supply Company of Pittsburgh, Pa., and 32 Cortlandt street, New York, are just issuing a new catalogue of 375 pages in a brown cloth cover. The first 30 pages are devoted to engravings of their different manufacturing plants and to showing some of the apparatus in use. The balance of the book is devoted to derricks for drilling and driving pipes and the different machinery connected with oil wells and a number of gas fittings and cocks. Several pages are given to a varied line of gas burners for natural gas adapted for use in cooking and heating stoves.

Merry & Clark, 535-547 West Fifteenth street, New York, have in stock and are receiving daily a large supply of Merry's Old Method Stamped Roofing Plates, which are meeting with an excellent demand. Merry's Lion American Terne and imported Monarch Old Style Ternes are also popular Plates and are selling freely. The notice in our advertising columns gives the particulars of their agency for Clark, Quien & Morse, Peoria, Ill., makers of Conductors, Eave Troughs, Gutters, Elbows, &c.

I. W. NUMAN, Canton, Ohio, distributes circulars illustrating and describing a variety of Pumps that he manufactures. These include Lawn Pumps, Sprayers and Fire Extinguishers. The advantages of the different devices are referred to in the circular.

C. R. DUNDORE has withdrawn from the firm of A. P. Swoyer & Co., dealers in Brass and Copper, 17 North Seventh street, Philadelphia. The business is continued by the other partners, A. P. Swoyer and J. W. Gaskill, under the old firm name.

HOWE SCALE COMPANY, Rutland, Vt., have arranged to make a complete line of Belknap Motor Company's Cyclone Coffee Mills which will be put on the market as the Howe Cyclone Mills. This concern has recently completed a plant for icing refrigerator cars for the Armour Fresh Beef Company, Kansas City, and are building an unloading plant for the Shore Sand Company, Millwaukee, Wis., which will take sand or coal from boats and deliver to the yards at the rate of from 60 to 90 cubic yards per hour. This plant consists of a trestle 18 to 20 feet wide, 20 to 22 feet high, extending the entire length of wharf.

THE OMAHA TINWARE MFG. COMPANY, Omaha, Neb., have been reorganized under the name of the Standard Tinware Mfg. Company.

ARTICLES OF INCORPORATION were recently filed by the Michigan Brass & Iron Works, Detroit, Mich.

A. ST. J. NEWBERRY, assignee of the Lorain Mfg. Company, issues a notice from Cleveland, Ohio, under date of March 9, to the effect that the report that the Lorain Mfg. Company had been reorganized, officers elected and arrangements made to start the works was entirely premature. The plan is under consideration, but it has not yet been finally agreed upon. The notice adds that the creditors will be advised as soon as definite statements can be made.

THE WHITAKER IRON COMPANY, Wheeling, W. Va., manufacturers of Black and Galvanized Sheet Iron, have placed a contract for the erection of their new steel rolling mill building, to replace the one destroyed by fire on November 12 of last year, with the Shiffler Bridge Company of Pittsburgh. The contract calls for the completion of this building within 90 days from February 28, but it is somewhat doubtful whether the plant will be ready for operation before summer. This building will be of steel, its dimensions being 135 x 515 feet. The statement that the contract price was about $100,000 is untrue, the cost being very considerably less than this amount.

THE LAMP DEPARTMENT of Holmes, Booth & Haydens, Waterbury, Conn., is now running eight hours a day, five days a week. Until recently it has run only four days. In the main mill the employees are working six days, eight hours a day.

THE FERRACUTE MACHINE COMPANY of Bridgeton, N. J., manufacturers of Presses and Dies, report that there are many more inquiries recently, and that their orders have gradually increased during the month of February, more orders having been received last week than in any previous week since last May. They have during the past year kept their pattern makers and designers at work, and have ready for the market a large number of new designs for Presses and other sheet metal machinery. All of their older Presses have been redesigned.

AVERY STAMPING COMPANY, Cleveland, Ohio, announce that their works are now in full operation. They state that they are prepared to name prices upon Steel Hollow Ware, Pressed Steel Seats, Washers and all kinds of light and heavy metal stamping and shearing of Steel Plates to pattern, such as Circles, &c.

SCOVILL MFG. COMPANY, 423 Broome street, New York, who for some time have been manufacturing a large line of Aluminum Novelties, Art Goods, &c., have perfected a number of additions to the assortment, among which may be mentioned Hair Brushes, Soap Boxes, Framed Mirrors, Shaving Mugs and Brushes, Perfume Bottles and Atomizers, Salt and Pepper Boxes, Drinking Cups and Mugs, Lemonade Shakers and Soda Glass Holders, Hair Pins, as well as some new patterns of Cabinet Picture Frames.

PEERLESS FREEZER COMPANY, Cincinnati, Ohio, advise us that this year they are making a 2-quart Peerless Freezer in addition to those mentioned in our issue of March 1, 1894. Their line of Freezers includes the Peerless, Giant and Zero, in sizes from 2-quart to 10-gallon.

The steady growth of the anthracite coal tonnage of Pennsylvania is shown by the *Coal Trade Journal* for the past seven years as follows:

1887	34,641,017	1891	40,448,336
1888	38,145,718	1892	41,893,320
1889	35,407,710	1893	43,089,536
1890	35,865,174		

The same authority places the total production of coal in the United States during the last year at 166,133,062 tons, a gain of more than 12,000,000 tons over the previous year. Of this amount only about 3,600,000 tons was exported, mainly to Canada and Mexico.

The Michigan Labor Bureau has made a thorough canvass of the present condition of labor in that State as compared with one year ago. During the period between September 1 and February 1, a total of 2066 factories and mills in all parts of the State were inspected. Of these, 377, comprising some of the most important, were entirely idle. Of those reported in operation, 1117 were running full time and 572 on short time, the latter showing a loss to labor of 82,627 hours per week. The number of workers laid off is 48,725, or about 43 per cent. of the whole. There has been an average reduction of wages in factories visited of 9.5 per cent.

The House Committee on Judiciary have reported favorably on a bill introduced by Representative Turner of Georgia providing that a receiver or manager of any property, appointed by any court of the United States, may be sued in respect of any transaction of his in carrying on the business, without previous leave of the court, exactly in the same manner as process would be served on the corporation if it were not in the hands of a receiver.

February's fire loss in the United States keeps up the large average of recent months, being $11,300,000, as compared with $10,000,000 for February, 1893. These continued heavy fire losses are beginning to bear hardly on the insurance companies. The *Journal of Commerce* says that 1894 threatens to be remarkable for its fire insurance failures.

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CHICAGO, MARCH 15, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
X, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14. 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@
IC, 20 x 28	12.25 @
IX, 14 x 20	7.62½@
20 x 28	15.25 @

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.60

	Per box of 56 sheets.
X, 14 x 56	29.50 16.50
XX, 14 x 56	32.50 18.20
X, 14 x 60	31.50 17.65
XX, 14 x 60	35.50 20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal, extra. IC, 14 x 20 ..... 7.25
Merinn, IC, 14 x 20 ..... 7.00
Almond, IC, 14 x 20 ..... 6.50
Mint, IC, 14 x 20 ..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20 ..... $6.00
" IC, 20 x 28 ..... 12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.50
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Junn:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00
Old Process:	
IC, 14 x 20	9.25
IX, 14 x 20	11.25
IC, 20 x 28	18.50
IX, 20 x 28	22.50
H. B. L., Old Style:	
IC, 14 x 20	7.75
IX, 14 x 20	9 25
IC, 20 x 28	15.50
IX, 20 x 28	18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 4-10¢	3 ¢
17 to 20	℔ 2 5-10¢	3 1-10¢
21 to 24	℔ 2 6-10¢	3 2-10¢
25 and 26	℔ 2 7-10¢	3 3-10¢
27	℔ 2 8-10¢	3 4-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....12¢ net.
Patent Planished....℔ D A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis.75%

Copper—

Ingot.

Lake.....11¢ @ 11½¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount, 30%.

Copper Bottoms.

Discount, 30%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(Tn No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu.	35¢
Plain, above 3 inch	15¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl.	43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass	

40 @ 45 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....6

Sheet Zinc—

600 ℔ casks..... 4¼¢
300 ℔ casks..... 5 ¢
Loose sheets..... 5½¢

Lead—

Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢ @12½¢
Hallett's.....11¼¢@11¾¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	60%
1¼ and under, Galv	52½%
1½ and over, Plain	70%
1½ and over, Galv	60%
Boiler Tubes, list Oct. 24, 1892	70%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1½¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6½¢
" Ground in oil, Red	℔ D, 6½¢
" Ground in oil, Brown	℔ D, 5½¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in bbls	53¢
Linseed Oil, Raw, in bbls	51¢
Mineral Paints	2@4¢
Orange Mineral	9½¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	84¢
Spirits Turpentine, in bbls., ℔ gal.	36½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.75
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, MARCH 16, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:	
Small lots	℔ D, 75¢
100-℔ lots	℔ D, 73¢
Ton lots	℔ D, 70¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:	
Small lots	℔ D, 70¢
100 ℔ lots	℔ D, 66¢
Ton lots	℔ D, 60¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:	
Small lots	℔ D, 65¢
100-℔ lots	℔ D, 60¢
Ton lots	℔ D, 55¢

Antimony—

Cookson	℔ D, 10¾¢
Hallett's	℔ D, 10¼¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—
List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

25@30%

Copper and Bronze Tubing—3¢ ℔ D more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3¼ inches inclusive	17¢ ℔ D
Over 3¼ to 5 inches inclusive	18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3¼ inches inclusive	18¢ ℔ D
Over 3¼ to 5 inches inclusive	19¢ ℔ D

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized	50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%
Ingot.

Lake	11¢
Ansonia Grade Arizona	10¼¢
Ansonia Grade Casting	9¾¢
Planished	net
Sheet and Bolt	25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips, Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized	60&10%
Lap or Slip Joint Terne	60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized	35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—

Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.

Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2.60	2.90¢
Nos. 17 to 20	℔ D, 2 70	3.00¢
Nos. 21 to 24	℔ D, 2.80	3.10¢
Nos. 25 and 26	℔ D, 2.90	3.20¢
No. 27	℔ D, 3.00	3.30¢
No. 28	℔ D, 3.05	3.40¢
American B. B.	℔ D, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment	℔ D, 11¾@12½¢
Patent Planished	℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel	℔ D, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75@76&5%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—

Lee's.....33⅓%

Lead—

American Pig	3¾¢@4¢
Bar	4¼¢
Pipe	5½¢, 20%
Tin Lined Pipe	10¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	6¾¢, 20%

Old Lead in exchange, 2¾¢ ℔ D.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ¼ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1¾ @ 2½

Linseed Oil:
Raw, ₱ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01⅝ @ .01⅝
In tin cans..... .01½ @ .02½
In bladders..... .01⅜ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₱ ton..... $30.00@$35.00
Asphaltum, Rock, ₱ ton..... $14.00
Coal Tar Felt, 1 Ply, ₱ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₱ roll 108 sq. ft..... $1.42½
Coal Tar Felt, 3 Ply, ₱ roll 108 sq. ft..... $1.85
Roofing Pitch, ₱ bbl..... $2.25

Pipe, Drain..... 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 5 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4½	88½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₱ bbl $1.17@$1.18
Rosin, E. & F..... ₱ bbl. $1.30@$1.42½
Rosin, G. & H..... ₱ bbl. $1.62½@$1.90
Rosin, I. & K..... ₱ bbl. $2.20@$2.60
Rosin, M. & N..... ₱ bbl $2.90@$3.00

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₱ sqr..... $3.25@$4.50
Pen Argyle, ₱ sqr..... 3.50@ 4.25
Peach Bottom, ₱ sqr..... 5.00@ 6.25
No. 1 Chapman, ₱ sqr..... 4.00@ 4.65
Lehigh Slates, ₱ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₱ sqr..... 2.70@ 3.20
Purple, ₱ sqr..... 3.50@ 4.50
Unfading Green, ₱ sqr..... 3.50@ 4.00
Red, ₱ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

⅛ & ¼..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₱ ℔..... 4¢
Smaller quantities, ₱ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8lbs., about 500 ℔, ₱ ℔..... 3½¢
½ bbls., about 300 ℔, ₱ ℔..... 4¢
Kegs, about 110 ℔, ₱ ℔..... 4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₱ ℔..... 4¢
Yager's Soldering Salts.
¼-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢@4½¢
Bertha (pure)..... 8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ℔..... 21½¢
Straits, pigs, ₱ ℔..... 21¢
Straits in bars, ₱ ℔..... 22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20..... $7.00
Alderly, extra quality, IC, 14 x 20..6.87½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.50
Atlantic, IC, 14 x 20..... 5.75
Bonus, Extra Coated, IC, 14 x 20.. 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.50
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
Dane, IC, 14 x 20..... 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 ....12.00
" IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.25
Fort Pitt, IC, 20 x 28..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28 ...12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Newcastle Real Old Method, IC, 14x20 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20..... 5.25
Palaclo, IC, 14 x 20..... 5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 8.00
Phœnix, IC, 14 x 20..... 5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Rooßng, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20..... 5.37½
Vigilant, IC, 14 x 20..... 5.50
Waldo Redipped, IC, 14 x 20..... 6.75
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.50
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Iowa, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merlon, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" " IX, 14 x 20..... 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" " IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7 25
Versailles, IC, 14 x 20..... 5 75
Youghiogheny, IC, 14 x 20..... 6.00

Imported Terne Plates—

Charcoal.
MF Grade, IC, 14 x 20..... $7 50
20 x 28..... 15.00
IX, 14 x 20..... 8.75
20 x 28..... 17 50
Pontymister Grade, IC, 14 x 20..... 6 50
20 x 28..... 13.00
IX, 14 x 20..... 7.50
20 x 28..... 15.00
Worcester Grade, IC, 14 x 20..... 5.75
20 x 28..... 11.50
IX, 14 x 20..... 6 75
20 x 28..... 13.50
Dean Grade.—IC, 14 x 20..... $5.37½
20 x 28..... 10.70
IX, 14 x 20..... 6.40
20 x 28..... 12.80
Abercarne Grade.—IC, 14 x 20..... 5.25
20 x 28..... 10 50
IX, 14 x 20..... 6.40
20 x 28..... 12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₱ ℔.
Melyn and Calland Grade. IC, 10 x 14..... $6.37½
" " IC, 12 x 12..... 6.62½
" " IC, 14 x 20..... 6.37½
" " IC, 20 x 28..... 12.75
" " IX, 10 x 14..... 8.00
" " IX, 12 x 12..... 8.25
" " IX, 14 x 20..... 8.00
" " IX, 20 x 28..... 17.00
" " DC, 12½ x 17..... 6.00
" " DX, 12½ x 17..... 8.00
Allaway Grade. IC, 10 x 14..... 5.75
" " IC, 12 x 12..... 5.87½
" " IC, 14 x 20..... 5.75
" " IC, 20 x 28..... 11.50
" " IX, 10 x 14..... 7.00
" " IX, 12 x 12..... 7.25
" " IX, 14 x 20..... 7.00
" " IX, 20 x 28..... 14.00
" " DC, 12½ x 17..... 5.50
" " DX, 12½ x 17..... 6.50

Coke.
Steel Coke.—IC, 10x14, 14x20 $5.25@$5.35
10x20..... 8.12½
20x28..... 11.00
IX, 10x14, 14x20..... 6.00
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plates

IXX, 14x26..(112 sheets)..... $13.35
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper..... net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz.... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₱ doz..... 18.00

Zinc—

600 ℔ casks..... ₱ ℔ 4¾¢
Per ℔..... 5¼¢

It Is Reported—

That Munnell & Young's Hardware store, at Canonsburg, Pa., was burglarized of several hundred dollars' worth of goods on the 1st inst.

That Horn Bros., Delavan, Minn., have sold their Hardware store to Shoen & Herring.

That Schockey & Co.'s Hardware business, at Abilene, Kan., will soon be removed to North Enid, O. T.

J. Walter Grimes has purchased the interest of C. L. Campbell in the Hardware firm of Campbell & Carlisle, Cambridge, Ohio. The new firm will be known as Carlisle & Grimes.

That H. Fiedler has opened a new Hardware store at Cuba City, Wis.

That Frank Broadhecker, Brownstown, Ind., opened his new Hardware and Stove store at that point on the 16th ult.

That C. W. Moffatt, Grand Gorge, N. Y., has sold his stock of Hardware and business to O. A. Maynard & Co.

That Edgar C. Trowbridge in the Hardware business at Waseca, Minn., has sold out.

That H. O. Monson & Co., Hardware merchants, Wheaton, Minn., have discontinued business.

That Millard Buxton has sold his interest in the Hardware store at Wingate, Ind., to Louis Benz.

That R. C. Walkup has disposed of his Hardware business at Mason City, Ill.

That William McCullough's Hardware store, Center Point, Ind., was burglarized on the 27th ult.

That W. S. Kaufman and D. N. Kaufman will soon open a Hardware store at Doon, Iowa.

That Baldwin Bros., Lincoln, Neb., have bought out the Hardware stock of Kelly & Co.

That burglars plundered the Hardware store of Thomas Parkinson, Muncie, Ind., on the 27th ult.

That Don Carlos, Hudson, Ohio, has bought out the I. N. Farrar stock of Tin and Hardware, and will soon again open the old store.

That the Hardware store of Coombs & Fulton, Burchard, Neb., was damaged by fire on February 21.

That Thomas Dodson has purchased his father's interest in the Hardware store at Canfield, Ohio, and will continue the business with an increased stock of goods.

That Schneider Bros. have opened a new Hardware store at Adams, Minn.

That John Wheeler's Hardware store, at Springville, N. Y., was destroyed by fire on the 28th ult.

That S. T. Howard has disposed of his Hardware store, at Le Roy, N. Y., to F. L. B. Taft.

That $300 worth of goods were stolen from the Hardware store of Owen McCarthy, Denison, Tex., on February 20.

That Klove & Mosey, Leland, Ill., have erected a building in the rear of their Hardware store, which they will use for the storing of Farm Implements.

That George N. Baldwin, Leonidas, Mich., expects to discontinue the Hardware business about May 1.

That J. W. Brock has sold his half interest in the Hardware store at Canton, Ill., to his partner, James Ewan.

That Charles Fink, August Geissler and T. K. Olson have bought out the Knatfold Hardware Company. Albert Lea, Minn., and have changed the name to the Albert Lea Hardware Company.

That the Hardware firm of Coon & Ellingson, Edgerton, Wis., have been dissolved by mutual consent. Mr Ellingson will continue the business.

Price-Lists, Circulars, &c.

ACME BELL & DEVICE COMPANY, 11 Gold street, New York, and Lancaster, Pa.: Bells, &c. An illustrated price-list shows the Acme Door Bell, Challenge Door Bell, Hotel Call Bells, Family Call Bells, Bicycle Bells, Bicycle Locks, &c.

THE SANDWICH ENTERPRISE COMPANY, Sandwich, Ill.: Descriptive circular of an Aërating Pump. This Pump is so constructed that the valves can be reversed, when the Pump forces air downward instead of lifting water up. In this way cisterns are aërated much more rapidly and effectively than when pressure is not applied to the downward current of air. The valves are reversed by a small lever at the front side of the base. This Pump was exhibited in operation at the World's Fair, and many orders were there taken from persons who have since sent in testimonials of excellent results obtained.

CAVERHILL, LEARMONT & Co., Montreal: Price current of seasonable goods. The book is devoted to illustrations and descriptions of Screen Doors, Window Screens, Wire Cloth, Screen Door Hinges and Catches and Lawn Mowers. The goods shown are largely of American manufacture.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A first-class PLUMBER and STEAM FITTER; a good job for a steady, good workman. Geo. A. Anthoine, 24 Alfred street, Biddeford, Maine. Mar. 17

MACHINIST to take charge of presses; one who understands the making of stamping and drawing dies for tinware; none but first class need apply; for Eastern city. "Machinist," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 17

A first-class TINSMITH; ready man on all kinds of tin and furnace work. C. & S. Hynds, Bainbridge, N. Y. Mar. 17

A SALESMAN for New York City and vicinity trade by a local stove house; must have experience and have good acquaintance. "Stove House," office of *The Metal Worker*, 96-102 Reade street, New York. Mar. 17

At once, a good TINNER; one who thoroughly understands inside and outside tin and sheet iron work; must be sober. Box 51, Osborn, Ohio. Mar. 17

A first-class SPRING MAKER, one who knows how to make coil and flat ribbon springs; also thoroughly understands tempering and drawing; state experience, and give reference from where last employed. "D. R.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 17

A practical MOLDER for architectural sheet metal work; must be a good designer and capable of estimating cost from drawings; state experience and salary expected. Box 472, Canton, Ohio. Mar. 17

FOREMAN for pattern department; must fully understand iron patterns for cored castings; permanent position if satisfactory; state experience. "Foreman" No. 517, office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 17

COMMISSION SALESMEN.—First-class salesmen visiting the stove trade in Southern Pennsylvania and New Jersey, Maryland, Delaware, Virginia, West Virgima, Kentucky and North Carolina, to carry as a side line a leading specialty in stoves on commission; the goods have been sold in all of the territory mentioned through work from the office, but the trade has never been visited; interested parties address at once, with reference and stating other goods carried. "Specialty," office of *The Metal Worker*, 96-102 Reade street, New York City Mar. 17

At once, a TINNER who understands retinning old tinware. Louis Dyer, 44 Dekalb avenue, Brooklyn, N. Y. Mar. 10

A FOREMAN for a wood pattern shop for stoves; must be a first-class draftsman and designer; references required. "D. and D.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 10

SALESMEN to carry our specialties, &c., on commission as a side line in Pennsylvania, Ohio, and the New England States. Clifton Springs Mfg. Company, Clifton Springs, N. Y. Mar. 10

A first-class TINSMITH who can invest $500, to manufacture milk coolers; write at once to H. W. Gazlay, Cortland, N. Y. Mar. 10

SITUATIONS WANTED.

By a young man 24 years of age, as TINSMITH and ROOFER; ten years' experience; city or country. L. Seinberg, 182 Christie street, New York City. Mar. 17

By a young TINSMITH experienced at most all kinds of tin, iron and slate roofing work; some knowledge of hot water heating. V. Jansen, Pleasant Valley, N. Y. Mar. 17

By a SHEET IRON WORKER, experienced in working heavy sheet iron; can lay out all kinds of work. John Sago, 177 East Third street, New Albany, Ind. Mar. 17

By a young man, as a TINSMITH; good habits and an all round workman; single. Box 406, Bainbridge, N. Y. Mar. 17

As PLUMBER, TINNER and GENERAL JOBBER in city or country shop; 12 years' experience; first-class workman. Geo. H. O'Neill, Box 315, East Brookfield, Mass. Mar. 17

A No. 1 PLUMBER, STEAM and HOT WATER FITTER; well posted in the above branches, laying out and figuring on work, will work on a percentage or by the day; will start on a trial of one or two months. A. Traphagan, Richmond, Va. Mar. 17

In sheet iron or furnace shop, by junior, strong young man; wages low to commence. "Shepherd," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 17

PLUMBERS; three first-class mechanics, would like to go out of New York City together or separately; no preference as to where; will furnish best references from last employers. A. Gillespie, 135 West 101st street, New York City. Mar. 17

By a young man, a graduate of the New York Trade School a year ago in the plumbing department; would like steady position to finish trade and get practical experience; good reference. R. S Sholes, Jr., Norwich, Conn. Mar. 17

As FOUNDRY FOREMAN, by a thorough mechanic of 25 years' experience on stove plate, heater, bench and jobbing work; a thorough knowledge of mixing and melting of iron; as to economy in manufacturing and judicial management, first-class reference from late employer can be given; water fronts and backs a specialty. "J. G. W.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 17

Steady work as TINNER under a good tinner or foreman, or as helper, clerk for hardware, stoves or tinware; three years' experience; best of habits and references. John H. Bowers, Navarre, Ohio. Mar. 17

By a man who works for the interest of his employers; has had over 20 years' experience in tin, sheet iron, country plumbing and furnace work; man of family, steady, reliable; can refer you to the best men in town. G. Smith, Box 337, Greenwich, N. Y. Mar. 17

By a first-class TINSMITH. L. Mularky, 27 Pike street, New York City. Mar. 17

By a TIN and SHEET IRON WORKER; eight years' experience; understands all kinds of outside work as leaders, gutters and roofing; also furnace, stove, range and fire place heater work and general jobbing; city or country. Frederick Taylor, Thomaston, L. I., N. Y. Mar. 17

By a thorough HARDWARE SALESMAN of several years' experience in the wholesale and retail business; thoroughly posted on builders' and general hardware; best of references; age 27; salary moderate. "Casten," 527 Wyoming avenue, Scranton, Pa. Mar. 17

By a good TINSMITH, who thoroughly understands all inside and outside work and general jobbing; city or country. S. Fox, 54 Suffolk street, New York City. Mar. 17

By a STOVE PATTERN MAKER of considerable experience on wood patterns for stoves. J. Jack, Wheeling, W. Va. Mar. 17

By a TINNER; nine years' experience on furnace and inside and outside work; references. W. E. Benninger, 73 Glen street, Glens Falls, N. Y. Mar. 17

By a practical STOVE PATTERN FITTER, in pattern shop; the applicant is thoroughly competent to act as foreman of shop; can furnish ample references as to ability, general character, &c. "Competent," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 17

By a man with 15 years' experience on tin cans for paint work; willing to work at reasonable wages; city or country. "J." 398 Bushwick avenue, Brooklyn, N. Y. Mar. 17

By a first-class CORNICE MAKER and TIN ROOFER; 15 years' experience; city or country. A. P. Dortman, 152 Varet street, Brooklyn, E. D., N. Y. Mar. 17

By a PRACTICAL TIN and SHEET IRON WORKER, capable of doing all work in this branch. N. Paradiese, care of Mr. Kron, 59 Forsyth street, New York City. Mar. 17

By a good METAL PATTERN MAKER; can build up or fit. H. C. Gilham, Lancaster P. O., N. Y. Mar. 17

Steady position as HARDWARE CLERK or to work in tin shop; good on roofing and spouting; references; good habits. "J. H. B. the Tinner," Walkerton, Ind. Mar. 17

By a thoroughly reliable man, expert in pump, wind mill and water supply business; well up in all kinds of machinery; have ability to manage factory or branch house. "Reliable," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 17

By a TINSMITH. Alex. Lottis, 112 Madison street, New York City. Mar. 17

As STOVE MOUNTER; 14 years' experience; have worked at all kinds of Work Chas. Diemer, 2209 East Thompson street, Philadelphia, Pa. Mar. 17

By a young man, as PLUMBER; some knowledge of tin work; steady, sober; city or country. "Plumber," 160 Walnut street, Bloomfield, N. J. Mar. 17

By a cornice and skylight maker, as FOREMAN of a small cornice shop, or assistant cutter in a large shop; nine years' experience; 27 years of age; understands English and German. L. D. Retman, 111 Delancey street, New York City. Mar. 17

As CORNICE MAKER and CUTTER, middle aged man, German; first-class hand on steam curving, mold machine or hand work. "A. C," care of G. Waker, 223 East Eighty-ninth street, New York City. Mar. 17

By a first-class DESIGNER and MODELER; long experienced; able to do lead in fancy trimmings and general ornamentations; original and fast. "Designer," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 17

By a MECHANICAL DRAFTSMAN who thoroughly understands heating and ventilating in all its branches; strictly temperate and reliable. J. P. Lisk, 636 Monroe street, Brooklyn, N. Y. Mar. 17

By a first-class CORNICE CUTTER and FOUNDER; 12 years' experience; not afraid of work; references. "F. F.," care of Broadbeck, 568 Ninth avenue, New York City. Mar. 17

As FOREMAN for a tin, sheet iron and cornice shop; 18 years' experience; or would like to hear of some good town to start business in. "J. B. B.," 12 Indiana place, Boston, Mass. Mar. 17

By a PRACTICAL COPPERSMITH, 20 years' experience; city or country. H. Schneiderman, 88 Essex street, New York City. Mar. 17

By a young PRACTICAL LEAD BURNER, with a good knowledge of plumbing, with some good plumber who could employ him to advantage; wages reasonable; references furnished. "W. H. S.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 17

By a young man, as a PLUMBER'S ASSISTANT; some experience at tinoing; Newark preferred. Wm. Bolz, 412 Washington street, Newark, N. J. Mar. 17

By a TINNER; understands all kinds of job work and plumbing; sober and industrious; married. C. F. Richards, Box 752, Gouverneur, N. Y. Mar. 17

By a PLUMBER; city or country. Arthur Wickers, 1406 Third avenue, New York City. Mar. 17

By a PLUMBER; city or country Wm. Clark 418 East Sixteenth street, New York City. Mar. 17

Steady work desired by a first-class SLATE ROOFER; some knowledge of tin work. Wm. P. Kennedy, General Delivery, St. Louis, Mo. Mar. 17

BOOKKEEPER and SALESMAN; young man, 24, a practical and thorough accountant and experienced in the hardware and stove trade; A1 references as to character and ability. "C. F. P.," 142 North Twentieth street, Philadelphia, Pa. Mar. 17

By an experienced TINSMITH, willing to work; city or country. Max Cohn, 148 Delancey street, New York City. Mar. 17

By a first-class PLUMBER, STEAM, HOT WATER and GAS FITTER; some knowledge of tin and sheet iron work; married; sober; good references; steady position desired. Edw. E. Silvey, 163 Locust street, Dover, N. H. Mar. 17

By a first-class PLUMBER, GAS, STEAM and HOT WATER FITTER; 14 years' experience; have worked in some of the best shops in New York City; references if required. Wm. Ashworth, Haledon P. O., N. J. Mar. 17

As BOOKKEEPER and CORRESPONDENT; understands the oil stove business thoroughly; well acquainted with the New England trade in that line; large experience; competent to take charge of an office; A 1 references. "B. and C.," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 17

By a TINSMITH; five years' experience; also understands plumbing; New York State preferred. Robt. C. Clifford, Potsdam, N. Y. Mar. 17

Steady work, by a young man used to all kinds of tin, sheet iron and furnace work; some knowledge of lead and iron pipe work; sober and good workman. L. H. Atkinson, Virginia P. O., Ontario, Canada. Mar. 17

BRASS WORKER wants a situation as bench hand, soldering, brazing or any other work. "Brass Worker," office of *The Metal Worker*, 59 Dearborn street, near Randolph, Chicago. Mar. 17

By a young man, 28 years of age, with 13 years' experience at tin and sheet iron work, roofing, cornice, stove, range, heater and furnace work; understands English and German. John Finck, 604 East Ninth street, New York City. Mar. 17

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 24, 1894.

DAVID WILLIAMS, - PUBLISHER

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CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND .....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Unmeaning Trade Terms.

There will be found in another department of this paper a letter from H. M. Sanders of Washington, under the title of "Cutter," in which he discusses a question that must often have arisen in the minds of those concerned with sheet metal work. Every one will agree with the reasonableness of his argument, which is that the term "cutter" is used in an entirely incorrect way. In the present day pattern cutting really means pattern drawing, and the work of actual cutting is in no way whatever related to the work of laying out a pattern. Our correspondent, however, is, we think, unduly exercised about this misnomer, or, rather, there are so many other absurdities in trade speech that if he undertook the task of reforming trade language he would have a labor that would occupy him through a Methuselah's lifetime. Especially about sheet metal do the absurdities seem to cluster. Any one at all familiar with tin plate nomenclature must call to mind a variety of descriptive terms whose original meaning has entirely disappeared. The coke and charcoal designations which formerly had a proper significance are now merely equivalent to any other adjectives expressing two grades of excellence.

Slow Reformation.

Reformation is coming about by very small degrees, but it is coming about nevertheless, and will ultimately prevail even, we believe, in that fortress of conservatism, the tin plate trade. The beginning of American manufacture has let in the entering wedge, and it is likely before many years that tin plates, both in their dimensions and qualities, will be classified in a more simple manner. We would not criticise exclusively the tin plate trade, for others are similarly open to attack. There is galvanized iron for instance, originally iron electroplated with zinc, which now, however, is made without any assistance from the galvanic current. The name has stuck after its significance has entirely disappeared. Or even the word "iron" itself in this connection might be cited as an example, since it is a well known fact that the material for practically all of the sheets is steel. Instances of a similar kind could be multiplied as long as space held out, but the few given are sufficient to indicate the work that is before whoever purposes to reform sheet metal nomenclature.

The Boland Trade Schools.

The handsome building on Madison avenue, between Fifty-first and Fifty-second streets, New York; known as the Boland Trade Schools, is now complete, and was opened with great ceremony by the Roman Catholic Archbishop in January last. The school, which has been erected for the benefit of the older boys of the Roman Catholic Orphan Asylum, is as yet only in operation so far as the theoretical classes are concerned. Practical trade instruction has not been begun, owing, it is understood, to lack of funds. The workshops occupy the whole of the ground floor of the building, and are spacious, light and well ventilated. The plumbing class room is, so far, the only one that has been equipped for work. It is possible that this department will start into operation in the course of a month or six weeks.

The World's Fair Buildings.

The South Park Commissioners, who now own the Chicago World's Fair buildings, were evidently greatly surprised at the bids they received for those structures on the 10th inst. From common report, contractors generally were expected to demand a bonus for the removal of the buildings, on the ground that it would cost more to remove them than the material could be sold for. But when the bids were opened, it was found that the buildings were considered of some value. Taking the highest bids on all the buildings, the commissioners would have received $36,596. This threw a new light on the subject. It was at once believed that if the buildings were worth so much they were worth a great deal more, and the bids were, therefore, incontinently rejected. Efforts will now be made to sell the several structures at private sale, in the hope to realize more. This is a case in which bidders injured their chances by bidding too high. They should have asked a bonus for removing each building. The Park Commissioners, it will be remembered, have been paid $200,000 by the World's Fair Commissioners to take the buildings off their hands, and the latter thought they had made a good bargain by getting out of the cost of removing the buildings, which they feared might exceed that amount.

The Tariff Bill.

Exasperation is steadily increasing among business men at the endless delays which are keeping the community in suspense concerning the future of the tariff. Week after week is spent in backing and filling, and predictions are growing more positive that the decision will not be reached until the summer heat drives our legislators from Washington. The fact seems to be forgotten by Congressmen that the interests in political questions which are paramount with them play a very subordinate role with the great mass of the people. With them lucrative employment of their labor or their capital is the consideration before which all others fade into insignificance. Americans are a long suffering people, but they will not indefinitely allow talkers to paralyze the men of action. To the workman who is out of employment or who is struggling along at cut wages and to the business man who is feeling himself drift hopelessly toward insolvency, high political interests have no meaning. They want immediate relief.

The regular monthly meeting of the Association of Iron and Steel Sheet Manufacturers was held in the *Times* Building, Pittsburgh, last week. Only routine business was transacted. The condition of the sheet trade at this time was reported to be very much depressed. None of the mills are working full time, while prices are very much lower than ever before in the history of the trade.

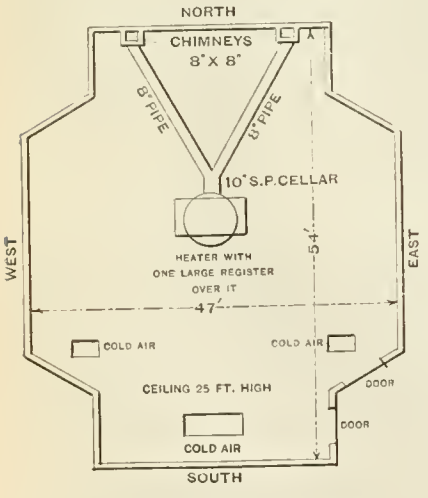
The British naval estimates for the year 1894–95, which were issued last week, show that the Government proposes to spend $83,355,000 on the navy in the next financial year. This is $15,000,000 more than the amount used in the past year; and it is described as being but a part of a complete programme which is to cover the operations of the British Admiralty for the next five years, the money for which will be voted in five annual installments. During the coming year seven new battle ships of the first class will be built, as well as six second class cruisers, two sloops and 36 torpedo destroyers of a new design. The *personnel* of the service is to be increased by 6700 men.

Liverpool's electric elevated railway, which has been in operation for a year, has proved entirely successful. A five-minute service of trains is maintained, and no mishaps of any kind have occurred. The road is 5 miles long, and cost, including equipment, $2,650,000.

THE LETTER BOX.

Wants Furnace Suggestions.

From A TINNER, *Montana.*—As a reader of *The Metal Worker*, I would like to ask a few questions on heating the church shown in the sketch. At each of the corners are halls and anterooms, but I do not include them in the plan, as they are not heated. The ceiling is not all of one hight, being 26 feet high in the center and 15 feet high at the sides, making a space of about 50,000 cubic feet to be heated by a furnace setting 18 feet from the chimney, which has a capacity to heat 70,000 cubic feet of space. It is connected with but one chimney now, which does not seem to have sufficient draft. Would it be better to connect it with both, as shown? There is one 27 x 38 inch register directly over the furnace, and cold air is supplied through ducts connecting with a 21 x 29 inch register at the front and two 13 x 21 inch registers, one at each side in the floor. The church is somewhat exposed to the winds by having a street on the east and south sides. It is moderately well built, and our coldest weather has been 16° below zero, which is a very rare occurrence. It is proposed to make some changes during the coming season, and I therefore ask



Wants Furnace Suggestions.

my fellow readers and *The Metal Worker* to make such suggestions as they think would aid in heating the church better than it is now heated. Would four smaller registers give better results? The furnace has a 10-inch smoke collar. Would it do better work if a Y was used to connect it to both chimneys, using an 8-inch pipe, or would it be better to build a round elbow in the bottom of the chimney and taper it to 10 inches in diameter and run a 10-inch pipe all the way from the furnace? Would two furnaces set to the right and left of the present heater with equal capacity to it heat better? They could not be set further to the front of the church conveniently. Is the hot air register large enough? Is there any rule for estimating or proportioning the capacity of the register to the furnace by which the proper size can be known? There is no ventilation in the church except by opening windows. The chimneys are straight from top to bottom and are well above surrounding buildings.

Note.—This call for assistance can best be satisfied by some of our experienced readers, and we hope they will respond freely. It is probable that more satisfactory criticism and suggestion could be made if the hight of the furnace cellar and the material, shape and dimensions of the cold air ducts were given. The chimney seems to be a troublesome feature in this case, and from the opinions expressed in *The Metal Worker* last December on connecting a boiler with two chimneys, the suggestion of building an elbow in the chimney and running the large pipe to it would seem the best. When a good draft is established and the furnace is under the full effect of a bright fire, it should do much better work, and improving the draft may prove a sufficient remedy. From the size of the smoke outlet in the furnace it would be naturally inferred that soft coal is burned, and to many the chimney would seem to lack capacity for the work even with the larger pipe. A rule used by a correspondent for computing furnace capacity was given in *The Metal Worker* January 20, which may be of some assistance. The register used seems amply large and the cold air registers are larger in proportion than are generally used, but the size of the ducts would have an important bearing on their efficiency.

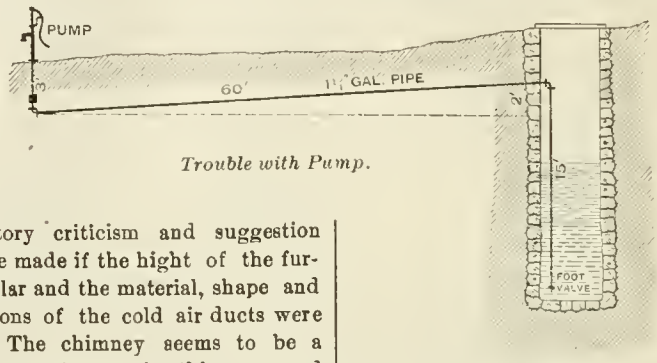
Pattern of Flaring Article—Oblong Bottom and Round Top.

From J. W. C., *Fillmore, N. Y.*—Please publish in *The Metal Worker* a method for obtaining the pattern of a flaring joint of pipe used on a sugar arch. The base of pipe to be oblong with semicircular ends, 10 x 32 inches, and the top to be round, 15 inches in diameter.

Note.—A method for obtaining the pattern of an article similar to the one desired by our correspondent was published in *The Metal Worker* of December 9, 1893.

Trouble With Pump.

From F. B. K., *Delaware, Ohio.*—I put in a pump as shown in the illustration and it does not work right. Perhaps some of the readers of *The Metal Worker* can tell me where the trouble is located. I put in another pump the same way, except that it was lower at the well than at the pump, and it worked without trouble. I think, therefore, the fall in the pipe may be the source of the difficulty in the present case and I would like the opinions of some of the readers on the subject.



Trouble with Pump.

Difficulty With Drive Well.

From E. B. S., *Mount Vernon, Ind.*—After reading the article of "W. M." of Little Falls, N. J., February 17, I infer that he attached a new pump to an old drive well. The presumption is that the old pump was worn out and a new one was put in its place. If such is the case, he will save time and money by drawing the pipe and putting on a new point with strainer fine enough to exclude the kind of sand in which the point gets its supply of water.

Roofing Queries.

From O. J. B., *Troy, Ind.*—In reply to "J. H. W.," in *The Metal Worker*, February 10, I employ the same method in putting tin together that he uses, but do not solder cross locks for standing seam roofing when the pitch is over 1 inch to the foot, and my roofs have always given satisfaction. In laying flat seam roofing a pair of ½-inch tongs is used to turn the edges on the strips. I never put a flat seam roof on in strips, if the strips run over 10 or 12 feet in length, but put it on one sheet at a time. I never nail my sheets or strips down by driving nails through them, but use cleats and nail them as close to the edge as possible and then mallet the seam down and use rosin for a flux in soldering. The rosin is applied by using an old soldering copper, heated hot enough to melt the rosin. The point of the soldering copper is placed on the seam and a lump of rosin is held on the heated copper which melts and runs down as the copper is drawn along the seam. In regard to painting roofing on both sides before it is put on, the idea is

good, but it interferes with the workmen if any soldering is to be done. I never let a roof remain unpainted any longer than a week if the weather permits me to paint it.

Tinner and Plumbers' License.

From R. Z., *Hoboken, N. J.*—Kindly inform me in *The Metal Worker* if it is necessary for a tinsmith to have a license to do plumbing and repairing inside of houses.

Answer.—In a great many cities plumbing work is subject to regulations made by the Board of Health, and in some places a plumber is required to take out a license. This is to provide that work that is important from a sanitary standpoint shall be done by competent men. Any man who is competent to do work can secure a license, and if it is required by the authorities no attempt should be made to work without one.

Objects to Exposed Piping.

From D. B. T., *Northville, N. Y.*—Replying to the inquiry of "L. W. F." in *The Metal Worker* March 10, I have a boiler from which the pipes go down to the cellar, then up through a partition to a bathroom. It has been in use two years, working all right, never making any trouble. The faucets for the sink are connected in the partition.

Who Makes It?

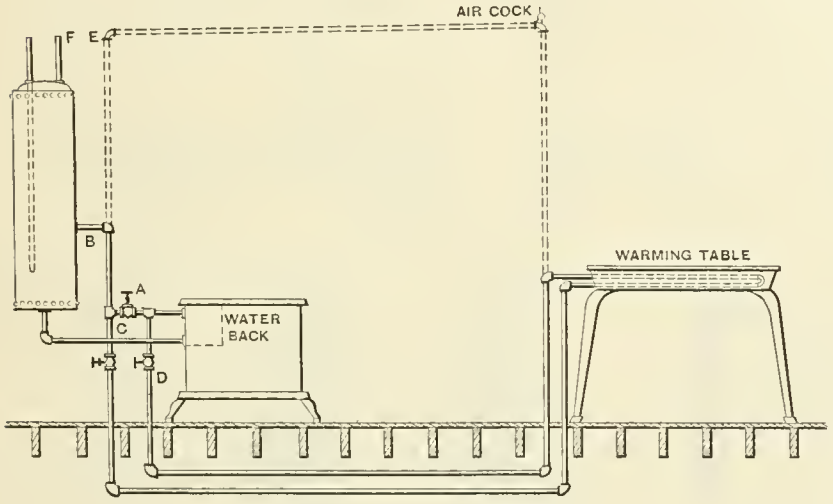
From C. F. C., *New York.*—Can some reader of *The Metal Worker* tell me who makes the Hyde Park hot water boiler?

Choked Flues.

From THOMAS HYDE, *Albany, N. Y.*—To enter into a theoretical explanation of the cause of the draft in the chimney of which "V. T." complains in *The Metal Worker*, March 10, would be too lengthy for me to take up at present. However, I will recommend that he takes a 7 or 8 inch pipe directly from the boiler to the chimney and up inside of it to a point a foot or more, as he chooses, above the top of the brick chimney, and stop up the opening at the point of entrance to the chimney, and also on the outside of the pipe at the top of the chimney. Then if the chimney is located as he says, so that the draft is not impaired by higher buildings nearby, and he does not find the draft increased 100 per cent., in fact, all that he can possibly need, I will agree to pay the cost of the experiment. A round flue is by all means the best. A properly proportioned square flue will work well enough.

Range Boiler and Warming Table.

From G. F. W., *Windsor, Conn.*—Please inform me in *The Metal Worker* if I will be able to get a circulation of hot water through the loop in the warming table without the aid of the stop at A in the illustration. I want to put in the warming table so I can shut it off from the range boiler when not in use and still use the range. Will the system work as I have it arranged, and will it give heat enough to keep dishes and food warm? The loop lies in a copper pan to be filled with water if necessary, and the table has covers to prevent loss of heat.



Range Boiler and Warming Table.

Answer.—In the system shown under heavy firing steam would form in the water back when the boiler was shut off, and the circulation that could be secured would not produce satisfactory results. To obtain proper circulation we would suggest piping it in the following manner: Use a T at the side connection of the boiler, with a stop cock between the T and the boiler at B. Run the pipe from the top of the T up to the ceiling and across to the warming table, as shown by the dotted lines, putting in an air cock, and then drop down and conect with the loop. Bring the return from the loop down and under the floor, as shown, and up and connect with the lower pipe from the water back at C, with a stop cock just below the connection, and take out the stop cock at A and all of the piping with the stop cock D on it between the warming table and where it connects with the water back pipe. This system of piping will permit a free circulation, and if any steam is made it can leave the water back. When hot water is to be used to heat the warming table the stop cock at C should always be opened first, then by closing the stop cock at B the hot water from the water back cannot enter the boiler, but must circulate through the coil. This system of piping will shut off the boiler, which may be objectionable, and if the water back has the capacity to heat water for both the boiler and warming table a connection from F to E will make the stop cock at B and the piping from the T at B up to E unnecessary. With this method of piping circulation through the table can always be cut off when desired by closing the stop cock at E. The amount of heat secured at the warming table will depend on the amount of surface exposed in the coil. If the coil is in water, it should have 1 square foot of surface for every 3 or 4 gallons of water, according to the temperature of the water in the coil and the amount of heat wanted at the warming table, and as it is improbable that the copper pan will hold more than half as much water as the boiler there should be no difficulty in securing satisfactory results if the coil is properly proportioned to the work.

Furnace Gas Burners.

From H. J. DAVIS, *Friendship, N. Y.*—I notice an inquiry in *The Metal Worker* of March 17 from "I. W.," asking for information in regard to apparatus for burning gas in a hot air furnace. Being a practical gas fitter, I submit the following for the benefit of "I. W.": If the gas main to which he intends to connect his furnace has a light or low pressure, he should put in a burner large enough to throw the blaze against the fire pot and sides of heater, in order to get good results. A considerable quantity of ordinary brick placed around the burner will help to hold the heat.

From MCCAHAN & CO., *Baltimore, Md.*—In answer to "I. W." in *The Metal Worker*, March 17, would say that we have a burner suitable for either furnace or cook stoves that is powerful and economical and requires but little space.

From SWIPED JOINT, *Charleston, W. Va.*—If "I. W.," who made inquiry about gas burners in *The Metal Worker*, will get the rules for setting the Economy furnace burner, made by J. E. McNamara, Columbus, Ohio, he will be able to decide as to its adaptability for his purpose.

Repairing Enameled Ware.

From J. L. S., *Baltimore, Md.*—Please tell me the best way to put tin or copper bottoms on enameled ware.

Note.—If our correspondent will consult *The Metal Worker* of October 7, 1893, he will find a letter with illustrations describing the work that he asks about.

Lake navigation for the 1894 season opens six weeks earlier than has been the case for years. Advices from Cleveland, Ohio, state that most of the fleet of boats have been fitted out. More than a dozen of the heaviest lake carriers left Cleveland port at the close of last week.

ROOFING AND CORNICE.

The Country Cornice Shop.

VIII.

BY CORNICE WORKER.

Leader Pipes.

Let Fig. 61 represent a section or profile of a round leader, the seam being shown at A. Fig. 62 is a rectangular or, as it is commonly called, a square leader, the seam being shown at B. The seam in Fig. 62 is supposed to lay against the wall of the building, but it is better to place it as shown at B′, so that in case the leader bursts the seam can be readily repaired without removing the leader. Fig. 64 represents a section of an octagon leader, the seam being shown, as indicated at E in Fig. 63. To draw the shape of the octagon leader, shown in Fig. 64, to full size, proceed as follows: Draw a square figure to the required size, as shown by A B C D, Fig. 63, and let F indicate the width of the corner which is to be broken. With C as center and F as radius, strike an arc, cutting the lines B C and C D; then again, with the same radius, and with D A and B as centers, strike the three arcs as shown. Draw lines through the intersections made upon the square, which will give the section of the octagon leader required, as shown in Fig. 64. Fig. 65 represents a section of a corrugated leader, which can only be made by those having special machinery for that purpose, but can be obtained in 8-foot lengths from dealers in tinners' supplies.

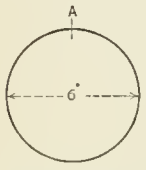


Fig. 61.—Section of Round Leader.

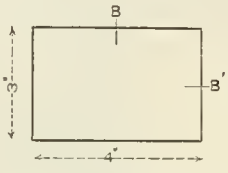


Fig. 62.—Section of Square Leader.

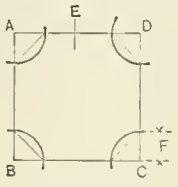


Fig. 63.—Obtaining Broken Corner for Octagon Leader.

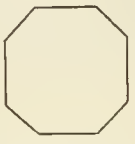


Fig. 64.—Section of Octagon Leader.

Fig. 65.—Section of Corrugated Leader.

Fig. 66.—Round Leader Riveted and Crimped.

Fig. 67.—Notching Flange on Square Pipe.

Fig. 68.—Square Riveted Leader with Flange Completed.

Fig. 69.—Octagon Leader Riveted.

Fig. 70.—Corrugated Leader.

Fig. 72.—Strip for Marking Rivet Holes.

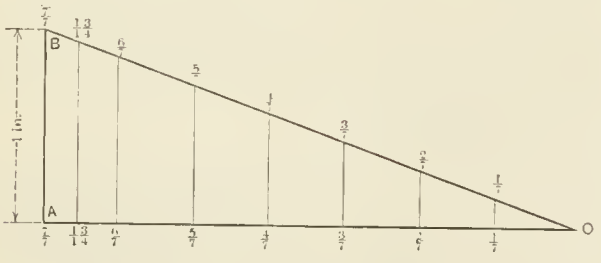


Fig. 71.—Diagram for Obtaining Fractional Parts of an Inch.

Fig. 73.—Rivet Punch.

THE COUNTRY CORNICE SHOP.

Fig. 66 is a perspective view of a round leader riveted and crimped at A. If the tinner has no crimping machine it is advisable to obtain one, as a great amount of time and labor is saved over the old method of drawing in the pipe on the mandrel stake. Fig. 67 is a perspective view of a square or rectangular leader, and shows the method of notching the flange joining into the next joint of pipe. Let us suppose that a 1 inch flange is required; then placing the width of the dividers to 1 inch, scribe a line round the top edge of the joint of leader, as shown by A B C D, Fig. 67, and measuring with the eye about ½ inch from the corner, cut a notch on each corner with the snips, as shown by the four dots over the lines A, B, C and D. It will be noticed that the flange is notched once on each side of the leader and the flanges bent slightly toward the inside of the leader, thus giving the appearance as shown in Fig. 68. Fig. 69 is an octagon leader, the flange for joining being notched in the same manner as described in Fig. 67, the only difference being that the square leader is notched on four sides, where the octagon leader would be notched on eight sides. Fig. 70 is a perspective view of a corrugated leader, the flange A being drawn in in manufacture.

Obtaining the Circumference.

Fig. 71 shows the method of drawing a full size diagram for obtaining

any fractional part of an inch, which is to be used when obtaining the circumference of any size of round pipe. Let us suppose that the diameter of the pipe shown in Fig. 61 is 6 inches; the rule for obtaining the circumference of any size round pipe is to multiply the diameter by 3.1416, which is a little more than $3\frac{1}{7}$: therefore the rule used in practice is to multiply the diameter by $3\frac{1}{7}$. To obtain the circumference of a pipe 6 inches in diameter, multiply 6 inches by $3\frac{1}{7}$, which equals $18\frac{6}{7}$ inches without lap ($\frac{3}{4}$-inch lap is usually given). To obtain the $\frac{6}{7}$ inch, construct the diagram as above referred to as follows: Draw any line, as A O, Fig. 71, to any

quired which was $4\frac{3}{4}$ inches in diameter, the same rule would be employed. Multiplying $4\frac{3}{4}$ inches by $3\frac{1}{7}$, the result would be $14\frac{13}{14}$ inches; as $\frac{6}{7}$ equals $\frac{12}{14}$, then bisect the space $\frac{6}{7}$ $\frac{7}{7}$ on the line A O, Fig. 71, as shown by the line $\frac{13}{14}$ $\frac{13}{14}$, which will be $\frac{13}{14}$ inch. By using the method shown in Fig. 71 any fractional part of a given hight can be obtained. If elbows were required for the round pipe it would not be necessary to figure out the circumference, as the stretchout of the pipe would be taken, on which to cut the miter pattern, and would at once give us the desired circumference. Suppose that a leader, the section of which is shown in Fig. 62, was to run

will be noticed that the first hole from the top is 1 inch from the end and the rest of the holes punched every 3 inches, leaving the last hole 2 inches from the end, as shown, and which will be the side where the leader will be crimped. The holes will be punched with a rivet punch, Fig. 73, the punch being a trifle larger than the rivets used, so as to allow the rivets to slip in easily. As leaders are usually cut from 2 foot wide iron, let us suppose that we have a pattern piece of iron before us which is 2 feet long by the circumference or stretchout of the pipe required; the lap used for riveting the leader being $\frac{3}{4}$ inch, set the dividers to one-half of

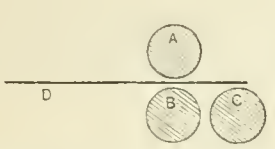


Fig. 74.—First Operation in Forming Round Leader

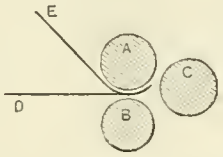


Fig. 75.—Second Operation.

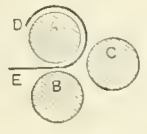


Fig. 76.—Third Operation.

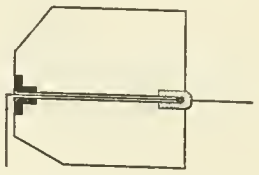


Fig. 77.—Forming Square Leader on Brake.—First Operation.

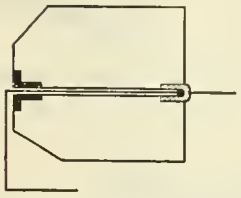


Fig. 78.—Second Operation.

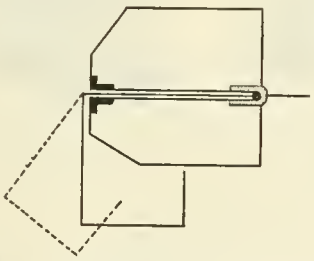


Fig. 79.—Third Operation.

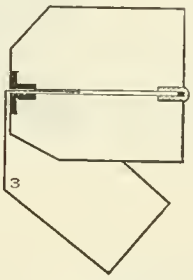


Fig. 80.—Fourth Operation.

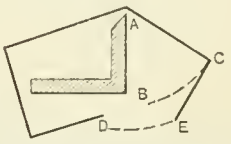


Fig. 82.—Bending Right Angle. First Operation.

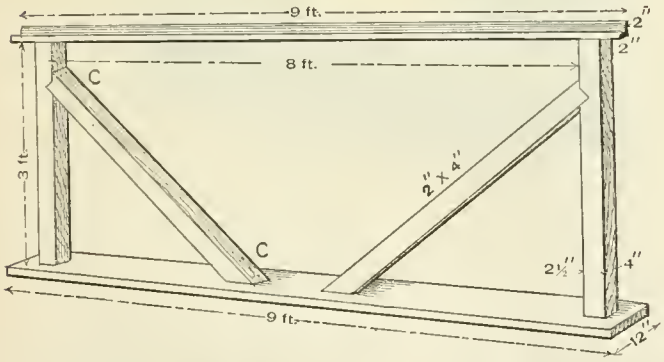


Fig. 81.—Home Made Hatchet Stake, 8 Feet Long.

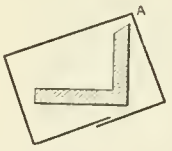


Fig. 83.—Second Operation.

Fig. 84.—Leader Strainer.

THE COUNTRY CORNICE SHOP.

desired length, upon which lay off seven equal spaces, and at right angles to A O draw the line A B, in length equal to 1 inch, as shown; draw a line from B to O, as shown. From the seven spaces obtained upon the line A O, as shown by $\frac{1}{7}$, $\frac{2}{7}$, $\frac{3}{7}$, $\frac{4}{7}$, &c., draw lines at right angles to A O, intersecting the line B O. Then will $\frac{1}{7}$ $\frac{1}{7}$ represent $\frac{1}{7}$ inch, $\frac{2}{7}$ $\frac{2}{7}$ represent $\frac{2}{7}$ inch, $\frac{3}{7}$ $\frac{3}{7}$ represent $\frac{3}{7}$ inch, and so on until the full inch is obtained. Then will $\frac{6}{7}$ $\frac{6}{7}$ in Fig. 71 represent $\frac{6}{7}$ inch, to be added to the 18 inches necessary for the circumference of a 6-inch pipe.

Suppose the circumference was desired of a pipe $5\frac{1}{2}$ inches in diameter, then multiply $5\frac{1}{2}$ inches by $3\frac{1}{7}$, and the result would be $17\frac{2}{7}$ inches; $\frac{2}{7}$ $\frac{2}{7}$, shown in the diagram in Fig. 71, would represent the $\frac{2}{7}$ inch desired. Then again if the circumference of a pipe was re-

down straight, no elbows being required; then knowing the size the leader is to be, no drawing would be required, the stretchout being figured thus: size of leader 3 x 4 inches; 3 + 4 + 3 + 4 + $\frac{3}{4}$ lap = $14\frac{3}{4}$ inches, including lap.

Punching the Leader.

Fig. 72 shows a strip which is used for marking off the rivet holes on the pattern when making leaders. In making strong, substantial pipe it is advisable to punch the holes before the leader is rolled up, and have the holes not less than 3 inches apart. To get the holes on one side of the pattern the same as on the other, so that they will meet when rolled or formed up, cut a strip of iron 2 inches wide by 2 feet long, or as long as the joint of pipe, and divide into spaces as shown in Fig. 72. It

$\frac{3}{4}$ inch, which is $\frac{3}{8}$ inch, and mark a line upon each side of the leader pattern where the holes are to be punched. Now take the strip shown in Fig. 72, and place it upon the pattern of the leader so that the center of the holes will come directly upon the two lines just marked, one at each side. Care should be taken not to reverse the strip when marking the holes upon the opposite sides of the pattern, otherwise they will not meet when rolled or formed to shape.

Rolling the Leader.

In Figs. 74, 75 and 76, A and B represent the sections of the front rolls of a stove pipe former and C, C and C in the same three figures the rear or back roll, which is raised or lowered to give the pipe the desired curve. If a sheet was run through the rolls as in Fig. 74 it

would run out straight at the other end, showing that the rear roll C is the roll which forms the pipe to the required circle. Let C in Fig. 75 represent the roll raised to its proper position to obtain the circle required.

When rolling the leader as in Fig. 75 place the sheet D in the position shown and turn the handle of the roll until the rolls grasp the sheet about ⅛ inch; now hold the handle steady with the right hand and raise the sheet with the left until it has the position shown at E, Fig. 75; this at once gives the small curve as shown and allows the sheet to pass up over the rear roll C. The handle is now turned until the leader has the required circle. If the tinner has the service of a stove pipe former, having what is called a slip roll, then the roll A, in Fig. 76, can be raised at one end and the pipe drawn off after it is formed; but if an old style roller is in use, then when the pipe has the position as shown at D, Fig. 76, the fingers or a piece of heavy metal bent V shape should be placed between the pipe and top roll, and turning the handle, draw out the iron at D, so as to prevent it from again entering between the rolls and until the side E has passed through. Should an old style roller be in use, it is well to raise the back roll C a little higher, thereby making a smaller circle, so as to compensate for the drawing out at D as before explained. After the leaders are all rolled they are riveted, using burrs if desired, and then crimped and soldered together in the usual 10-foot lengths.

Bending Square Leader.

In Figs. 77, 78, 79 and 80 are shown enlarged sections of a country cornice brake, previously described, which will be used to bend off the square leader, in which there are four operations required. Let us suppose that the leader has the shape shown in Fig. 62, and that the seam is to be at B. After the bends are dotted off on the sheet, place it in the brake and make the first bend as in Fig. 77; draw out the sheet to the next dot and make the second bend as in Fig. 78; then again draw out the sheet to the third dot, and make the third bend as shown in Fig. 79. When making the fourth bend, shown in Fig. 80, it will be noticed that the bottom of the leader strikes against the bottom of the brake; therefore after making the third bend, shown in Fig. 79, draw it back again as shown by the dotted line in the same figure. Draw out the sheet to the fourth dot, and make the fourth bend as in Fig. 80. A hatchet stake will now be required, upon which to make the bend 3, Fig. 80, square.

A Home Made Hatchet Stake.

Fig. 81 is a perspective view of a home made hatchet stake, 8 feet in length. The leader is but 2 feet in length, but the object in making the stake 8 feet long is so that it can be used for making the different bends in a molding 7 feet long, if so required. The construction of the stake shown in Fig. 81 is clearly shown. It will be noticed that the base board is 1 foot wide by 9 feet long by 1 inch thick, upon which the 2½ x 4 inch upright joists are placed, 3 feet in hight, braced with 2 x 4 inch split joists on the inside, and nailed or screwed, as shown at C C. Obtain a piece of angle iron ¼ x 2 x 2 inches, and 9 feet in length, made perfectly straight, and screw it upon the upright joists, as shown. The top edge of the angle iron should be filed off so that it will appear as shown at A, Fig. 82. When bending off the angle of the leader above referred to, place the leader in the position shown in Fig. 82, and press down the corner C, which will then make a sweep, as shown by the dotted lines C B and E D, Fig. 82, and will look when finished as shown in Fig. 83.

When making the bend A, Fig. 83, the corner will be rather round. To obtain a square corner use the wooden mallet. Do not use the hammer, as the edge A of the angle iron would be flattened. The method used for the square leader would be followed in forming the octagon leader, Fig. 64. Before riveting the square leader it should be first tacked and soldered, care being taken that the pipe is not lopsided. After the joints are soldered and riveted they are put together in the usual 10-foot lengths.

Fig. 84 is a galvanized wire strainer, which is placed over the inlets of leaders to prevent them from stuffing up. They can be obtained from 2 to 12 inches in diameter.

Cutter.

From H. M. Sanders, *Washington, D. C.*—While it is not always best, perhaps, to disturb traditions handed down to us, they may sometimes open up a fruitful source of inquiry as to whether some of our traditional phrases are not misnomers and out of place—or, perhaps, out of date. Take, for example, this simple but traditional word "cutter." We know—that is, the trade knows—what it means as applied to a department in the sheet metal industry. The craft generally recognize it as expressing an important position in the trade. A firm advertises for a cutter, but they want a man who is able to lay out and develop patterns. So a man who advertises to fill a position as cutter has the same end in view. As in neither case do they advertise for the purpose of filling a position in the cutting room of a cornice shop, so in neither case, as it seems to me, does the term or word cutter express fully what they want. As a fact, the term cutter simply expresses the idea of cutting out work from a pattern, and not the development of that pattern. The simple act of cutting a pattern is one thing and the laying out and developing of that pattern another thing. The former, in a certain sense, is a mechanical process, while the latter is a mental process to the extent of laying out and planning the work. In other words, one requires practical knowledge as distinct from the other, which requires theoretic knowledge. While a man may become a good cutter in its true sense when he has had the necessary hand and eye training, he may know nothing about laying out and developing patterns. On the other hand, a man may understand the theory and be able to lay out and develop patterns and yet be the poorest kind of a cutter. Both elements combined, theoretic and practical knowledge, are essential; not surely to make simply a good cutter, but an expert in the development of patterns and laying out work. What might do in former times when the cornice busi-

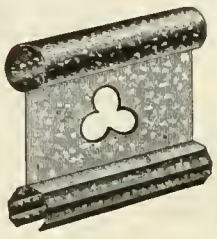


Fig. 1.—*Block No.* 1.

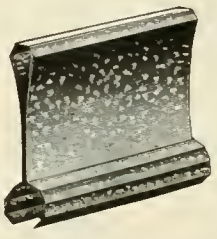


Fig. 2.—*Block No.* 2.

Fig. 3.—*Block No.* 3.

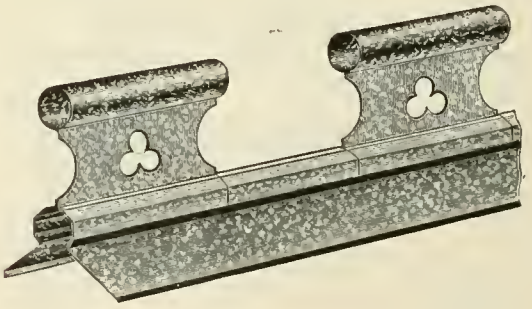


Fig. 4.—*Blocks in Place on Ridging.*

GARRY RIDGING BLOCKS.

The Garry Ridging Blocks.

We illustrate in the accompanying engravings new designs of the Garry ridging blocks manufactured by the Garry Iron & Steel Roofing Company, Cleveland, Ohio. These blocks can be made from either painted or galvanized steel, and can be adjusted on the ridging to any position by simply pressing the apron of the ridging together. This, it is pointed out, frees the block so it can be moved wherever desired, and as the aprons again spring back to place the block is held securely, no solder being required. Figs. 1, 2 and 3 illustrate the three designs of the blocks, while Fig. 4 shows block No. 3 in place on the ridging. The blocks are made to fit style B bridging of the Garry Iron & Steel Roofing Company, 2½-inch roll, although they can be made to fit the other sizes if desired. They also make blocks to fit a plain ridging.

ness was in its infancy, and a man made his own patterns and got out the work himself, seems meaningless and out of place now under later and newer conditions of trade, when business is brought down to system with its various departments and classified work.

There is the soldering room, machine room, stamping room, cutting room and drafting room. Usually when any help is required in any of these departments, outside of the drafting room, there goes out an advertisement for a corniceman. But when it comes to filling a vacancy in the drafting room, by common consent, or tradition, or whatever you may call it, a cutter seems to fill the bill; and yet, if there is any one of these departments more than another that needs a corniceman to meet fully its requirements, it is the drafting room. We would not think of advertising for a draftsman to fill a position in the cutting room, but it is less out of place than to advertise for a cutter to fill a position in the drafting room. One seems about as sensible as the other, and, laying aside the traditional aspect of the case, both seem out of place, if not absurd.

FLASHINGS.

E. C. Atwater & Co., Springfield, Mass., have been awarded the contract on the Y. M. C. A. Building in that city for the copper cornice and base, galvanized iron, tin and metal ceiling. The work will require 3500 pounds of 16-ounce copper.

Alfred Frommhold, 71 Wells street, Chicago, has removed his cornice works to more commodious quarters at No. 72 on the same street.

The Berger Mfg. Company, Canton, Ohio, issue to the trade their 1894 catalogue and price-list, which is the eighth annual publication of the sort. This firm are the well-known manufacturers of Berger's patent eaves trough hangers, corrugated and plain conductor pipe, ridging, capping, cornice, window caps, &c. They likewise make steel roofing, corrugated iron, steel brick, rock faced stone, metallic shingles, patent ceilings and shutters. In a preliminary announcement to the trade they mention that they have, since issuing their seventh catalogue, added to their already large factory the latest improved machinery for the manufacture of sheet metal goods. The first part of the volume is devoted to eaves troughs and eaves trough hangers, as well as conductor pipe, conductor hooks, &c.; then come miscellaneous goods such as cut offs and strainers. American roofing plates are noted, as well as ventilators of various sorts. Ridgings and crestings are given several pages with illustrations. Then come cornices, window caps and finials, of which many varieties are illustrated. The second part of the volume is devoted to the roofing section. After rules for measurement and directions for applying, together with a summary of the advantages of this class of roofing, attention is given to the various roofings that the Berger Mfg. Company make. Corrugated iron, metallic shingles, siding and ceiling, &c., follow, and at the end notice is made of fire proof doors and shutters and miscellaneous goods. An alphabetical index facilitates reference. The pamphlet is bound in red paper with the company's name stamped on the front cover.

An iron roofing factory is contemplated at Webster City, Iowa, by Charles Crary and other residents of that place. They propose to erect a one-story building, 200 x 60 feet, and manufacture corrugated iron, metal roofing, metal shingles, ceilings, cornices, steel brick, &c.

The skylights in Meurer Bros.' new tin plate works in Brooklyn are composed of wire glass. This material makes them impervious to the missiles of the small boys of the neighborhood, who have already tried their hand on the inviting expanse of glass without any damaging effect.

The following is an interesting experience on the connection of tin and copper in roofing that has come under the notice of Borkel & Debevoise, 42 and 44 East Houston street, New York, who were called upon to make repairs. The valleys on a large building were originally of copper and were found too narrow to render good service. The tiling of the roof was taken off in order to increase their width. This was done less than two years ago, when, owing to the cost of copper, a heavily coated tin plate was used. It is now necessary to do the work again, as the action of the copper not only destroyed the tin coating, but made the plate look like a piece of old lace. The copper is still in good order, so that there was no difficulty in opening the seam and soldering to the new copper, which is now being used to widen the valley.

The Kansas City Metal Roofing & Corrugating Company, Kansas City, Mo., distribute an illustrated circular of the goods they handle. At the beginning of the catalogue is a copy of the United States Standard Gauge adopted last year, which will be appreciated by the trade. The first goods noticed are corrugated iron, illustrations directing attention to the 2½-inch plain edge corrugated iron in sheets 5 to 10 feet long and 26 inches wide. Sectional views show the full size of the corrugations. An assortment of ridge caps are next noted. Then come other styles of corrugated iron, beaded iron, weather boarding, pressed brick, standing seam roofing, V-crimped roofing, &c. Among these notice is made of the curved corrugated iron used for arches and awnings, &c. Corrugated iron laths are also mentioned, being illustrated and described. Under metallic shingles are shown the Walters, Cooper's Queen Anne and the Hamaley. Eave troughs, conductor pipes, hooks and hangers are noted; a variety of roof crestings, likewise ornamental iron finials. These goods are followed by fencings, shutters, felt roofing, &c. At the end is a telegraphic cipher that will facilitate ordering goods by wire.

The Knisely & Yeldham Roofing Company, 68–74 West Monroe street, Chicago, have the contract for the copper cornice work, skylights and tin roofing for the Haymarket Theater, 161–179 West Madison street.

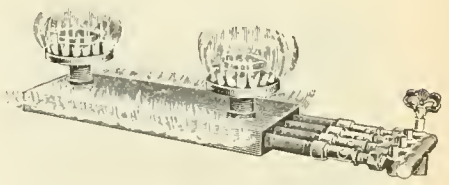
According to careful estimates, three hours of close study wear out the body more than a whole day of hard physical exertion.

Gas engines are growing in favor in Australia for factory purposes. The colony of Victoria alone possesses more than 300 of these engines.

Advices from the East state that Japanese coal is attaining some considerable success. A recent shipment to Bombay, India, was found very satisfactory, as its cost is nearly 50 per cent less than that of Welsh coal landed at that port, while the consumption is only 8.50 per cent. higher.

Cooking Burners.

The illustrations herewith show some gas burners made by the Hollands Mfg. Company, Erie, Pa., for use in the fire chambers of ordinary cooking stoves or ranges. They are specially made for the use of natural or fuel gas and are



Cooking Burners.—Fig. 1.—Sectional Burner with Four Supplies.

adjusted to a pressure of about 3 ounces in operation and are not adapted to the low pressures ordinarily found in city mains for illuminating gas. Fig. 1 shows a sectional four flame burner with controlling keys and air mixers at the right end, so arranged that a flame can be used under either or both cooking holes, and a flame lengthwise on either

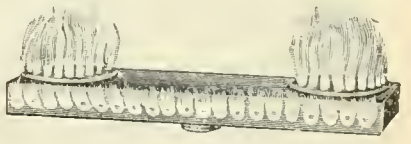


Fig. 2.—Burner with One Supply.

or both sides of the burner. Fig. 2 shows a burner with but one mixer and supply, and with flames along each side of the burner and under both of the cooking holes. Fig. 3 shows an air mixer such as is used in connection with many different styles of gas

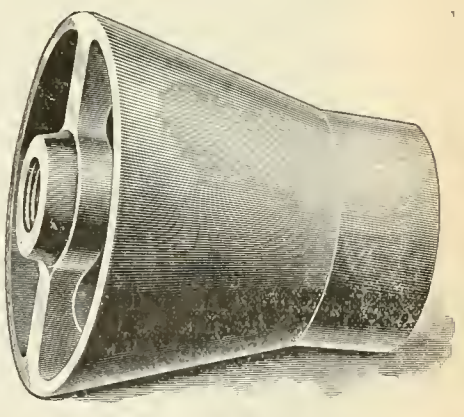


Fig. 3.—Air Mixer.

burners. These goods are made in various sizes to suit different requirements.

The Panama Canal is again becoming a topic of interest in the French capital. Although nothing definite has been settled it is believed that a new company has been formed for carrying on the work. M. Bartissol, a famous contractor, and M. Eiffel are said to be the moving spirits of the undertaking.

STEAM AND HOT WATER.

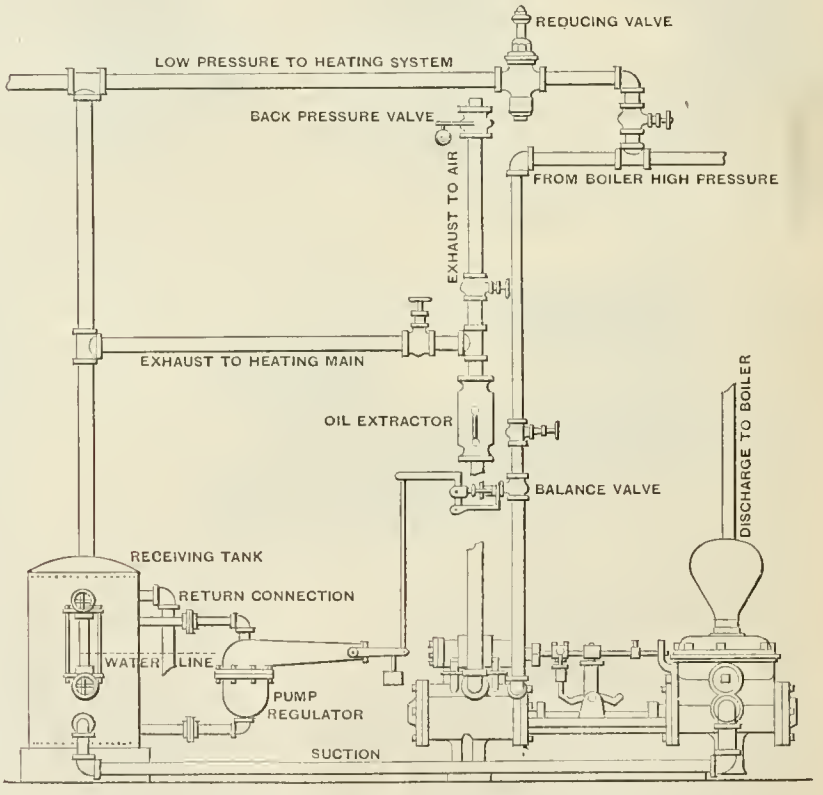
The Value of Exhaust Steam for Heating.

BY HELIOS.

It is not well known, yet it is a fact, that a building can be warmed by exhaust steam with a less cost for coal than it can be heated with a low pressure gravity return circulation apparatus, and the higher the pressure is carried on the boiler the less coal it will take to do the heating. The system of piping, however, should be so arranged that there will not be over one to two pounds back pressure on the engine or pumps, and this can be done in a heating plant for a building of any size. At the present time all large office buildings have steam pumps for the elevators and engines for electric lighting, and the exhaust steam from all pumps and engines should be used for the heating of the building, as the exhaust steam is too valuable to throw away. In placing heating apparatus for exhaust steam heating the piping must be of ample size to deliver the steam to the radiation without any back pressure on the engine or pumps, and this can be done by the size and arrangement of the main exhaust steam pipes.

In an exhaust steam heating apparatus, to receive the full benefit of all the coal consumed under the boiler, all the exhaust steam must be used and all condensation returned to the boiler without loss. The exhaust steam as it leaves the engine or pump must first pass through an oil extractor, as shown in the illustration, to remove all the cylinder oil from the steam. If the cylinder oil is allowed to enter the piping it will bake on the piping and radiation and decrease the amount of the radiation of heat, and if the oil is allowed to enter the boiler it is liable to cause the boiler to prime and the sheets to blister. Another serious fault is that it will cause a disagreeable odor to the steam or air that may blow into the building in removing the air from the radiation.

In connecting up the feed water heater it is very necessary that valves are placed in all connecting pipes, also that a by pass is made around the heater, so that at any time repairs have to be made to the heater the valves can be closed in the pipes to the heater, and the by pass opened, allowing the steam to pass around the heater and permitting repairs to be made without shutting down the plant. After the steam has passed through the feed water heater, take off two branch pipes, one to connect to the heating system and one to discharge the exhaust steam into the air. The main exhaust pipe should be 25 per cent. larger in area than the combined area of all exhaust pipes connecting to it. In the pipe that discharges the exhaust steam into the air place a back pressure valve, and into the pipe that connects to the heating system a gate valve. The back pressure valve should be set so that it will open when the pressure is above two pounds per square inch on the heating system. For furnishing steam to the radiation at such times as the engine or pumps are not in operation, and for supplying steam, if there is not enough exhaust steam to fill the radiation, connect a pipe direct from the boiler or from the high pressure steam main to the main exhaust pipe, and place in it an automatic reducing valve, this valve to close if there is one pound pressure on the heating system, and to open if below that pressure. If there is exhaust steam enough from the engine to fill the radiation and keep one pound pressure on the heating system, the automatic reducing valve will keep closed; if there is not enough exhaust steam, the automatic reducing valve will open and supply the necessary amount of steam to keep the pressure on the heating system at the pressure at which the reducing valve is set.



Exhaust and Direct Steam Connections, Receiving Tank and Pump.

If the engine is shut down the reducing valve will open and supply direct steam to the radiation; as soon as the engine is started and the exhaust steam increases the pressure the reducing valve will close. If the engine is running and there is not enough exhaust steam to fill the radiation and the reducing valve is supplying steam direct from the boiler, should there be an increase in the volume of exhaust steam the reducing valve will close, and if the increase of exhaust steam continues the back pressure valve will open, relieving the pressure and closing as soon as the pressure is below 2 pounds.

On the end of the exhaust pipe that discharges the exhaust steam into the air always place an exhaust condenser head. This is placed for a double purpose: first, to prevent the condensation being thrown out on the roof of the building; second, to save all the condensation and return it to the boiler. To have an economical power and heating plant great care must be taken not to allow any steam to be wasted, and the condensation from the feed water heater and radiation, condenser head, cylinder cocks and drips of every and all kinds must connect into the return tank, as every pound of hot water lost means so much more coal to operate the plant. Another great loss is allowing the main steam and exhaust pipes to be uncovered. It will cost $80 per year for each square foot of heating surface on a main steam pipe that is not covered in a plant that is in operation 24 hours per day. Connect all return pipes and all drip pipes to a receiving tank, connect the suction pipe of a direct acting steam pump to the receiving tank and place the pump so that the condensation will flow to the pump.

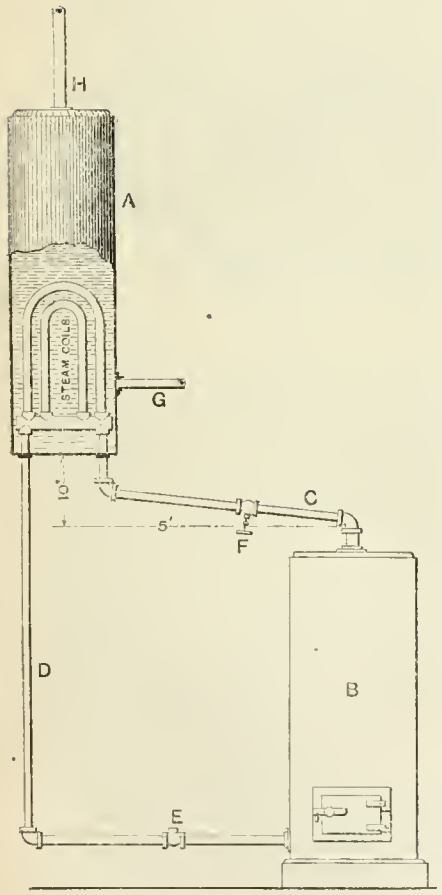
An automatic pump regulator is connected to the receiving tank and to a valve in the steam pipe to the pump. As the condensation returns to the receiving tank, the automatic regulator will open the valve in the steam pipe to the pump, starting the pump, drawing the condensation from the receiving tank and forcing it through the feed water heater and into the boiler. As soon as the pump lowers the water in the receiving tank to the water line the automatic regulator closes the valve in the steam pipe to the pump, stopping the pump. In ordinary weather the pump regulator will control the speed of the pump, so that it will run all the

time and keep the water at the water line in the tank. A plant connected up as has been explained above will work perfectly and economically.

In a building with an electric light plant, using the exhaust steam for heating, where all the exhaust steam can be used and none is wasted, the electric lighting will cost nothing, as it will cost less for coal to run the electric light plant than it would to heat the building by a low pressure gravity return circulation apparatus. The engine acts as a reducing valve, and the loss by condensation in the engine is very slight. It will not take any more coal to run the engine than it will take to allow the steam to pass into the heating system through a reducing valve.

Returning Condensation to Boiler.

From Y. J. W., *Raleigh, N. C.*—Will *The Metal Worker* kindly inform me if a steam boiler connected with a



Returning Condensation to Boiler.

100-gallon boiler, as shown in the illustration, will heat the water and operate successfully? The question is whether the condensed steam or water in the heating coil will return to the steam boiler, which carries a pressure of 80 pounds. In the illustration, A is a 100-gallon water boiler, B is a 15 horse-power steam boiler, C is the steam pipe, D is the return pipe, E is a check valve in the return pipe, F is a globe valve on the steam pipe, G is the cold water pipe to the hot water boiler and H is the hot water pipe leading from it. A high pressure boiler is to be used, and if the condensation will not return against an 80-pound pressure the system will not be satisfactory. If a steam heating job is constructed on the usual low pressure gravity system, how high can the pressure on the boiler be raised before the condensed steam in the return pipe will fail to return to the boiler? Why will not the condensation return to a boiler carrying a 60-pound pressure as well as to one carrying a 10 pound pressure? Is the pressure the same where the return pipe enters the boiler as it is at the dome? If not, what is the difference?

Answer.—The condensation in the system shown will return to the boiler without difficulty if it is properly piped, and the check valve will not be needed. The pipes should have a positive pitch and there should be no traps. The coil should expose 1 square foot of heating surface for every 5 gallons of water. In a correctly piped heating system where the return does dip below the boiler the condensation will not be prevented from returning to a boiler carrying any pressure that the system will stand. The pressure is the same practically at the flow and return, except that the weight of the water bears on the return.

Crane Company.

Crane Company, Chicago, Ill., have added another to the number of branch houses and supply depots already maintained by them in various parts of the United States, by leasing the premises at 122 to 130 Center street, corner of White street, New York. They have the street floor, floor above and basement, each 80 x 95 in size. The offices, occupying a part of the street floor on the Center street side, are trimmed in light hardwood. The balance of the floor is fitted up with appropriate bins and shelving for carrying a stock of brass and iron fittings, &c. The floor above is for much the same purpose, while pipe, pipe machinery and the heavier classes of goods are provided for in the cellar. The company, established in 1855 and incorporated 10 years later, manufacture extensively at their several factories in Chicago and Pittsburgh, wrought iron pipe, malleable and cast iron fittings for steam, water and gas; also brass and iron valves, cocks, gate valves and hydrants, steam and gas fitters' tools, engineers' and engine builders' supplies. Among their branch houses are those at Philadelphia, Pa.; Omaha, Neb; Kansas City, Mo.; Minneapolis, Minn.; Los Angeles and San Francisco, Cal.

Fusible Plugs.

From Boiler Maker, New York.—In answer to "Steam Fitter," in *The Metal Worker*, February 10, the melting point of fusible plugs should be at a temperature which corresponds with the temperature of the steam at a pressure which the boiler is limited to carry. They should not soften under the temperature of the ordinary steam pressure carried. Pure tin is considered most reliable, as alloys become less fusible in use and are more readily coated. Here are some alloys with the temperatures at which they soften and melt:

Two parts tin and two parts lead soften at 365° F. and melt at 372° F.

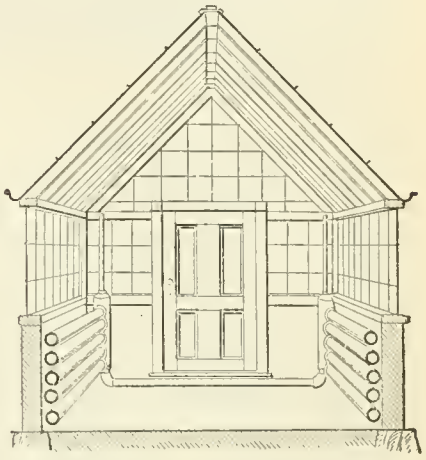
Two parts tin and six parts lead soften at 372° F. and melt at 383° F.

Two parts tin and seven parts lead soften at 377½° F. and melt at 388° F.

Two parts tin and eight parts lead soften at 395½° F. and melt at 408° F.

Heating Greenhouse With Hot Water.

From OLIVER TWIST.—Hot water heating, like every other business, has its difficulties, which can only be overcome by experiment and thought. The difficulty in the case which is described and illustrated was to continue the circula-



Heating Greenhouse with Hot Water.—Fig. 1.—Method of Passing Door.

tion of hot water past a doorway in a greenhouse which is heated by wall coils. An annex had been made to the greenhouse, and the hot water boiler then in use being thought too small to

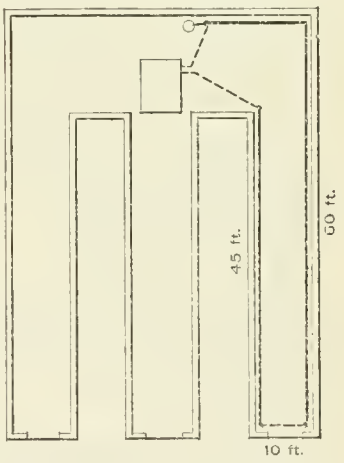


Fig. 2.—Plan of Greenhouse.

properly heat it, in addition to what it already had to do, it was decided to make a water back similar to that shown in Fig. 3, which shows an elevation and plan of it. It is made of five pieces of 1¼-inch pipe, connected with

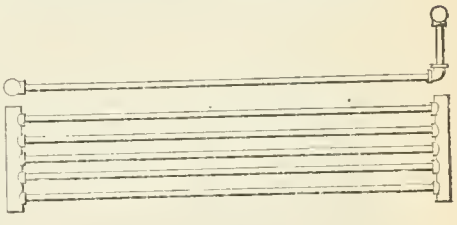


Fig. 3.—Plan and Elevation of Auxiliary Heater.

elbows and headers, as shown, being 5 feet long. This is placed in the furnace at an inclination of about ½ inch to the foot at or near the top of the fire box. This supplies about 600 feet of 1 inch pipe, arranged in wall coils five pipes high, as may be seen by reference to Figs. 1 and 2. Fig. 2 shows a plan of building in which can be seen the location of boiler. Fig. 1 shows the

method of getting past the doorway. A 1¼-inch pipe is taken from the bottom of the header and continued down to and across the floor, then up and into the bottom of the header on the opposite side of the door. From the top of each header is taken a ½-inch pipe, which runs up to a hight somewhat above the level of the expansion tank, to allow for expansion of the water without overflowing. This plan gives good satisfaction.

HEATING NOTES.

THE LATEST POSTAL TRAVELER sent out by the United States Heater Company, Detroit, Mich., carries on the back a broken view of the Hecla steam heater, showing clearly all its features of construction. On the front is presented a scene from Iceland, features of which are Mount Hecla, polar bears and walruses. The accompanying text tells of the tempering influence of Hecla in this arctic region, and is illustrative of the efficiency of the boiler of that name.

A HANDSOME CATALOGUE is issued in the interests of the Royal hot water heating apparatus manufactured by Hart & Crouse, Utica, N. Y. The volume, containing 20 pages, is bound in tinted cardboard with stamped title, and has for frontispiece a wash drawing showing in a conventional way the awarding of the wreath of victory to the Royal heaters. The pamphlet gives general observations on hot water heating with special reference to the advantages of the Royal system. Then come cuts showing general, broken and sectional views of the Royal heaters. After them are tables of sizes, capacities, prices, &c.; then directions for using and instructions for setting up Royal hot water heaters, the whole closing with a brief list of some of those who are using this apparatus.

J. D. & C. C. LINCOLN, 236 Water street, New York, are making preparations for an active campaign in the heating business with the line of steam, hot water, hot air and combination goods made by the Fuller & Warren Company, Troy, N. Y.

CARLETON W. NASON of the Nason Mfg. Company, 71 Beekman street, New York, manufacturers of ten to one Equator steam and Gulf Stream hot water boilers, is making a tour of the West Indies.

WARREN C. JOHNSON of Oskaloosa, Iowa, has leased his foundry and machine shop to George Greasby. Mr. Johnson will continue the manufacture of hot water heaters and coal drills.

THE FUEL GAS & MFG. COMPANY of Pittsburgh, Pa., send us a circular of the Whyssall patent boiler burners, designed for use in connection with steam boilers. This burner is only one of many which they make in addition to their line of heating and cooking apparatus.

THE LOVE MFG. COMPANY, Corry, Pa., send us a catalogue of their Vulcan fuel gas burners, which are said to work with a pressure as low as one ounce by enlarging the gas orifice in the mixer. They are made for heating stoves and cooking stoves. A special sectional burner is made for furnaces, steam and hot water apparatus, so that one or five sections can be operated as desired.

LAST TUESDAY John A. Scolly, 70 and 72 Myrtle avenue, Brooklyn, received from the foundry of John Davies, Second avenue and Eleventh street, 60 of his improved hot water boilers. His men are engaged in erecting the heating plants in a number of residences and greenhouses.

THE GRIFFITH HEATING AND VENTILATING COMPANY and Wicks & Hughes, two of the largest concerns in eastern Washington, have consolidated. The members of the new firm are J. H. Griffith, George H. Hughes and George E. Clark, and will be styled the Griffith Heating and Plumbing Company, located at 110 Howard street, Spokane.

THE NEW HAVEN HEATING & PLUMBING COMPANY, New Haven, Conn., issue a catalogue illustrating and describing the Shearlock hot water heater of their manufacture. The first illustration is a broken view of the boiler set in brickwork, and shows clearly its constructive features, indicating the shell water space and the drop tube arrangement of surface. The next is a sectional view through the middle of the apparatus. Together with the illustrations are given full descriptive particulars speaking of the general advantages of hot water heaters, and also of the particular merits of the Shearlock. A table of sizes and prices is given, together with testimonial letters from many of those who have used the apparatus.

H. P. BLAIR & Co., South Bend, Ind., will handle the United States Heater Company's Hecla steam and Capitol hot water heaters.

Specifications for Heating and Ventilation.

In the absence of previously prepared drawings and itemized specifications there is a great tendency in the drawing of proposals, descriptions or specifications for heating and ventilating work to make them in all things too general. While this is manifestly true in the case of ordinary steam heating, it is most noticeable in many instances where contracts are made for the installation of the blower system. This is doubtless due in a great extent to the lack of knowledge of and experience with this system, which is still further affected by the fact that there exists no uniformity in the manner of designating the sizes of fans, while heaters are frequently specified of given "capacity" and engines of "ample" size. In fans of the same general design there is but little difference in efficiency, but all similarity of size or capacity is covered under a system of consecutive numbering, or by such indefinite descriptive appellations as 5 x 7½, B10, 120 inches or 10 x 5. Under such a classification one would naturally expect the capacity of the fan to serve as an indication of its size, but here we find the same fan having different capacities like a steam engine according to the speed at which it is driven. Even when that is given we are told by the manufacturer, if we press him to it, that the tabulated capacity may be seriously affected by the unknown resistances that may exist in a system of ducts or pipes over whose construction or design he has had no control. And yet, as viewed by the manufacturers this is all proper and only a necessary inconvenience of the business. Air is not like water, in that it is non-compressible, and the comparison drawn between the action of a pump and that of a fan blower does not hold. The pump if it works at all must (like the so-called "positive" blower of the rotary pump type) always deliver a given volume of the fluid passing through it, but the fan blower is automatic; when resistance is interposed the volume delivered and the power required is reduced.

When a fan blower is to be described at all, its type, diameter of wheel, width of wheel and greatest diameter of inclosing shell should be given, together with the size of engine when such is to be provided. In blowers of even reasonably good construction, driven at the speed necessary for heating work, agreement in these points will be indicative of substantially equal capacity, for there is practical accord between different manufacturers in the matter of inlet and outlet sizes, width of fan wheels at their periphery and minor proportions. Heaters for hot blast work vary more radically in design and construction, and choice must be made upon judgment and experience. But the size should be given definitely in the actual number of running feet of given size pipe (almost universally 1 inch) exposed to the air as it passes through the heater. It should not include outside headers or connections or portions of pipes screwed into the faces.

Certainly nothing is better or more satisfactory for the purchaser than a guarantee—that is, where there is somebody of responsibility behind it. A specification or contract containing such a warrant may, of course, with reason, omit much of the detail of description. A fan, engine and heater of "ample" size may then be sufficiently explicit. But let the guarantee be likewise explicit. Let the contractor by all means avoid a legal promise to make the system "satisfactory." What satisfies one man may not another, and the most painstaking care may not be sufficient to secure the approval and the desired payment from a man who sets up "satisfactory to the owner" as a bulwark behind which to hide and avoid his honest debt. Properly, the condition of outside temperature at which a given inside temperature is to be maintained should be specified. But an explicit guarantee to heat to, say, 70° when the thermometer stands at 0° outside may often be a source of serious trouble to the contractor in the matter of securing his payments. With such warm winters as we have recently experienced zero days are rare, and a mutual test of the system under the specified conditions may be exceedingly difficult to secure during the short time that the desired outside temperature continues. There is no reason why the guarantee of any reputable house to heat to, say, 70° in zero weather should not be sufficient, and any owner can reasonably assure himself of the adequacy of the apparatus at outside temperatures above the minimum specified.

In factory heating by the blower system it becomes a matter of particular importance, in drawing a guarantee, to clearly specify or describe the buildings and rooms covered, and to state whether the result is to be accomplished by the use of live or exhaust steam (pressure to be specified) and whether air is to be taken from out of doors or returned from within the building. The blower system is still so novel to many that they are unqualified to judge of the relative efficiencies of different sized apparatus, but the time will soon come when a more general understanding on the part of the public, and greater uniformity in the character of the specifications drawn by experts, salesmen and manufacturers, will result in greater certainty and a clearer comprehension in the minds of all concerned.

PLUMBING and GAS FITTING.

Plumbing at the Baron de Hirsch Trade Schools.

The plumbing classes at the Baron de Hirsch Trade Schools, 225 East Ninth street, New York City, are reported to be in very successful operation. Since their inauguration on January 1, 1893, 40 young men have received certificates of proficiency. All these youths have, it is said, succeeded in obtaining remunerative employment in the trade and are now at work, earning a good livelihood. The plumbing classes are under the able direction of a New York Trade School graduate—Bernard Bedanes—who has organized the course of instruction closely on the lines of that institution. He teaches both the day and night classes, in which there are at present some 40 pupils. There is no fixed period for the course of instruction, but pupils are certificated as soon as in the judgment of the instructors they are sufficiently proficient to merit a diploma. The average time occupied by each pupil hitherto has been six months for the day class and nine months in the evening class. Those attending the evening class are generally employed as plumbers' helpers during the day or in some other business. Some of the graduates from the day plumbing class, however, who are employed in the neighborhood, return, in order to take the evening course, which is rather more advanced in character.

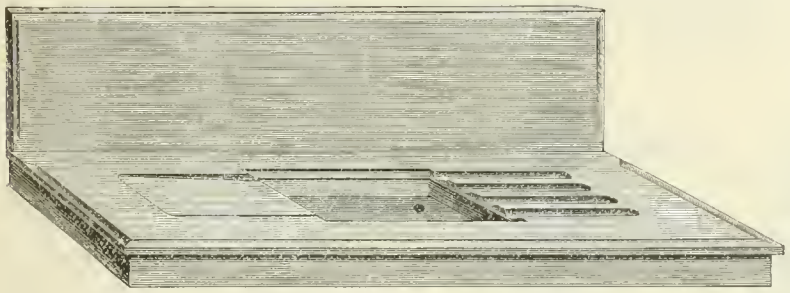
The only drawback in connection with these plumbing classes is the lack of space. This alone prevents their being extended very materially. At present numbers of applicants for instruction are refused on this ground, as there is accommodation for only about 20 pupils at one time. In order to overcome this difficulty it is in contemplation to build a couple of additional stories on to the present structure, giving each trade an entire floor for its operations.

The other trades taught in the schools are carpentry and wood turning, machinist's work and painting, all the classes for which are well attended. The institution is appreciated as a boon by the class for which it was established, namely, poor and friendless Jewish youths of Russian and Roumanian origin.

The Mechanics' Supply Company, 96 St. Peter street, Quebec, Canada, send out a batch of blotters on which is a variety of advertising matter relating to their business, which is in plumbers', gas and steam fitters', engineers' and machinists' supplies. Half of the blotters are printed in English and half in French.

Slate Butler's Sink.

Fair Haven Marble & Marbleized Slate Company, Fair Haven, Vt., are bringing out a new slate butler's sink. The fixture consists of a simple slab of slate, having in the middle a shallow sink of the same material, which drops below the slab. The ends of the slab are either countersunk or corrugated, as desired, allowing a rapid and perfect drainage.



Slate Butler's Sink.

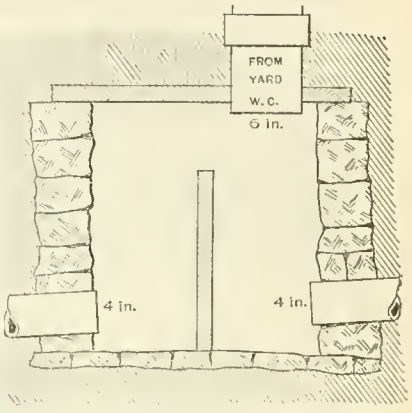
They are made in ten regular sizes' with wall or splash slabs, if desired.

Mayor Lane & Co.'s New Building.

Mayor Lane & Co , 119 Walker and 42–44 Mott streets, New York, dealers in plumbers' materials and gas and steam fitters' supplies, are now consolidating their entire business under one roof by moving into their handsome new building at 128, 130 and 132 White street, the rear of which adjoins their present quarters. In the erection of this building, which is now about completed, the steel skeleton system of construction was adopted. It has been their purpose to make the structure thoroughly modern and fire proof. The front is a combination of cream colored Anderson pressed brick, Warsaw blue-stone and iron, so arranged architecturally as to give a very handsome effect. There are nine stories and a basement, each measuring 60 feet front and 85 feet in depth. The building will be supplied with electric power and light and an electric elevator. Mayor Lane & Co. will occupy the street floor and floor above, together with the basement. The balance will be rented for light manufacturing or similar purposes. The street floor will be reserved for show-rooms and offices. They will have here at least two exhibition bathrooms, tiled and with every detail complete. The offices will be in the rear and finished in antique oak. The remainder of the space will be utilized for sampling their goods. The floor above this will contain their stock of brass goods, earthenware and kindred lines, while heavy goods, including iron pipe and fittings, sinks, cast iron materials, &c., will be kept in the basement. The whole building is admirably lighted both naturally and by artificial means.

Some Poor Plumbing.

In one of his lectures before the plumbing class at the New York Trade School, Chief Instructor John Delehanty used the following illustrations of some defective work which came under his notice. Mr. Delehanty is a practicing master plumber of the firm of Roach & Delehanty, 906 Columbus avenue and 679 Second avenue. Fig. 1 shows a mason work trap with an upright partition in it and having a 6 inch inlet in the top and a 4-inch inlet in the side and a 4-inch outlet. It was discovered



Some Poor Plumbing.—Fig. 1.—A Mason Work Trap.

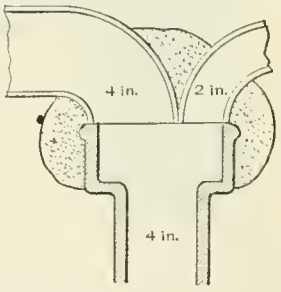


Fig. 2.—An Economical 1.

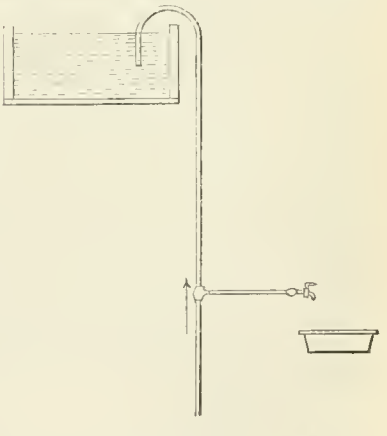
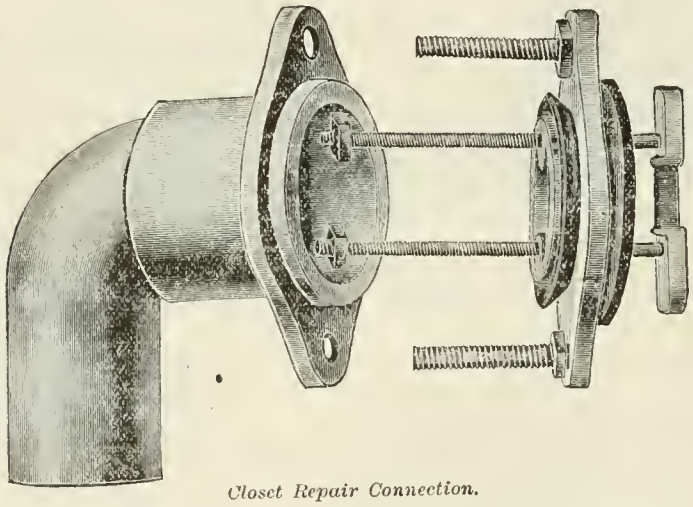


Fig. 3.—Drinking Faucet Syphons from School Sink.

through the bottom inlet becoming stopped and the leakage creating a stench in the cellar. Fig. 2 shows a 3 and 4 inch pipe connecting with the hub of a 4-inch pipe, a "wiped" joint being made of Portland cement. A portion of each pipe extended beyond the hub and a considerable leak resulted from the cement becoming cracked. Fig. 3 shows a school sink on a floor above a faucet used to draw water for drinking. Owing to the water supply pressure failing at times to reach the faucet water was syphoned from the school sink. The supply pipes were so changed that such a result was impossible.

Closet Repair Connection.

The illustration herewith shows a device made by the Phillips Mfg. Company, 219 East Thirty-fourth street, New York, for repairing water closets on which the flush or vent horn is broken. In the past a new closet has been necessary in case of such an accident, and the expense has been no inconsiderable annoyance. The method of using the device given by the manufacturers is to file or chip with a sharp chisel the broken horn until a smooth, flat surface is obtained. Then the loose bolt is unscrewed from the crossbar, which is inserted in the horn and the bolt replaced, leaving the crossbar always in a vertical position. Next pass over the ends of the bolts the brass flange, which has a rubber washer made to cover both sides, and screw the nuts down on the bolts so that the flange bears evenly against the closet, making a tight joint which it is claimed will last for years without the use of lead or putty. These bolts can now be cut off if desired. The brass coupling, which is secured to the flush or vent pipe by a wiped joint, is now secured to the flange against the rubber washer by the flange bolts. A rubber coupling is also made for use with closets where the original connection has been made with rubber. It is claimed that by means of this device many expensive water closets that have been accidentally broken can be retained in use and give perfect satisfaction.



Closet Repair Connection.

We receive from the H. Mueller Mfg. Company of Decatur, Ill., a catalogue of their specialties in brass and lead for water and gas. In cities where a high water pressure is carried a hole larger than 1 inch is not allowed to be made in the pipe where a branch connection with several feeders taps the main and supplies a larger pipe. They furnish these branches with heavy lead pipe connected to them by a wiped joint and with a corporation stopcock on the other for water companies that do not employ a plumber.

Manhattan Mosaic Marble.

A material that is furnished in all of the various forms to which marble and granite are adapted is being made by the National Mosaic & Marble Company, 13 West Forty-second street, New York, and is known as Manhattan mosaic marble. It is made of marble chips and pure Portland cement subjected to a pressure of from 10 to 20 tons. Columns, vases, table tops, wainscoting, floor tiles and stairs and balustrades give an idea of its adaptability. Tiling and slabs are made with designs in different colors in addition to the mosaic effect of the ground work. It is made into slabs for all the purposes for which plumbers use marble, slabs for lavatories, water closets, urinal stalls, and is also made into bathtubs, sitz baths and lavatory bowls. A catalogue is now being prepared giving illustrations and descriptions of the marble and its uses. The floor in the New York Produce Exchange is laid with these tile. The window sills, steps and columns of the St. John's College of Brooklyn and the floors of the Carter Building in Boston, the Club House at Saratoga Springs and the Carnegie Library at Pittsburgh, are all tiled with the Manhattan mosaic marble. The company have showrooms at 159 La Salle street, Chicago, and works at Stamford, Conn. On May 1 the New York office will be moved to the Metropolitan Building, at Twenty-third street and Madison avenue, where a fine show of their goods will be made.

TRAPS AND VENTS.

The committee from the Plumbers', Gas and Steam Fitters' Union of Buffalo, N. Y., which waited upon the master plumbers when in convention in that city recently, reported to the union, and further effort will be made to arrive at some agreement with the master plumbers to govern the number of apprentices employed.

C. D. Rodgers and John P. Freeman have formed a copartnership in the plumbing business, under the firm name of Rodgers & Freeman, with headquarters in the Glandon Building, at Mexico, Mo.

"We are making all styles and sizes of aluminum pantry and kitchen sinks; our catalogue of them is not yet ready for distribution, but we will be pleased to quote prices on receipt of inquiry," is the announcement on a postal card that is being sent to the trade by Manager John Pearce of the New York office, at 43 Beekman street, of the W. S. Cooper Brass Works of Philadelphia.

M. J. Gorman is traveling in New York and R. McGuire in New England in the interest of the Henry McShane Mfg. Company, 625–627 Sixth avenue, New York. They talk the Lucania syphon closet and the Egyptian enameled baths, also an extensive line of standard goods. An invitation is given to visit their New York showroom, where some handsome goods are displayed and two bathrooms are fitted up with considerable elegance.

Harry M. Rendell, formerly connected with a plumbing establishment in Utica, N. Y., has accepted the position of estimating clerk with Leonard D. Hosford, 43 Beekman street, New York.

Peck Bros. & Co., the well known manufacturers of plumbers' supplies, are preparing at their factory, New Haven, Conn., what will be, perhaps, the most elaborate showroom in this line of business in the country. The room is 60 x 70, well lighted and finished in birch, which is permitted to retain its natural color. The apartment is now being fitted up with a full line of the goods manufactured by Peck Bros. & Co., and will include eight bathrooms complete in every detail. The brass goods will be attractively arranged in handsome showcases and the closets set up on raised circular platforms about the pillars supporting the upper floor. The room is now open to the inspection of visitors, and although the beauty of the woodwork may be appreciated, the full effect of the display when completed can only be guessed at. Additions are constantly being made, and the end will not be reached much before autumn, probably. The arrangement of the showroom is under the supervision of W. E. Hinsdale, who has made a reputation in this line of work The offices of Peck Bros. & Co. also have been remodeled and brought up to date in every feature. They are extremely handsome and convenient, and in many respects are models in their way.

A good use is made of *The Metal Worker* manual, "Practical Hints on Joint Wiping," in the Baron de Hirsch Trade Schools in New York City. Two copies of the work have been cut up and the two parts have been pasted on two large sheets. These, having been framed and glazed, are hung on the walls of the plumbing classroom for reference and perusal by the pupils. We are informed that this arrangement has been found very useful. Not only the text, but the illustrations, serve to impress the various points in connection with the joint wiping process on the minds of the learners. The pictures are found particularly valuable in this Jewish school, where many of the pupils have but a limited acquaintance with the English language.

James W. McCartney is opening a plumbing shop at Ellenville, N. Y.

Walter Calhoun, who has conducted a plumbing establishment at the corner of Market and Livingston streets, Amsterdam, N. Y., has purchased an interest of the business of Edward P.

Williams of 5 Spring street. The business will be continued under the firm name of Williams & Calhoun.

Levi Thurston, John Hale and Albert Hale have remodeled a store on Dock square, Rockport, Mass., and are about to start a plumbing and hardware business.

Hermenegilde Roy and Zenon St. Aubin have gone into partnership in the plumbing business in Montreal, Canada, under the firm name of Roy & St. Aubin.

Rock Island Heating & Plumbing Company were recently incorporated at Rock Island, Ill.; capital stock, $10,000; incorporators, Terry F. Burke, John Joers and Ernest Wagner.

Edward G. Allenbrand has bought the plumbing establishment of Alex. M. Mann on East Third street, Dunkirk, N. Y.

Solomon Gillespie is to occupy a new building that is being erected at Bound Brook, N. J., as a plumbing shop.

E. Armit has opened a plumber's shop in the north basement of the Miller & Huehn Block, at Hammond, Ind

Under date of March 14, notice is issued to the trade that the copartnership heretofore existing under the firm name of Curry & Hebblethwaite, Melrose, Mass., has been diasolved by the retirement of Joseph Hebblethwaite. Robert A. Curry will continue the business at the asme stand under his own name.

Secretary Ed. O'Donoghue informs *The Metal Worker* that the plumbers of Ogdensburg, N. Y., have organized and are enrolled as members of the New York State Association of Master Plumbers and have elected the following officers: President, P. H. Doyle; vice-president, Thomas H. Lavier; treasurer, Chas. Lavier; secretary, Ed. O'Donoghue; sergeant at-arms, O. W. Havens.

Kerregan & Ward is the name of a firm which have recently gone into business in Lewiston and Auburn, Maine.

R. & J. Robertson have opened on West street, Beverly Farms, Mass., a branch plumbing establishment.

Yarrington & McCabe, plumbers, have leased the store in Lewis' Block on Main street, Derby, Conn., and are fitting it up for use.

The Legislature of Ohio has under consideration a measure that is to require the examination and licensing of plumbers. The bill provides that in every town of 5000 or more inhabitants, and in every town having a system of water supply or sewerage, there shall be a board of examiners of plumbers of five members, three of whom shall be practical plumbers (one journeyman and two master), and of which the health officer and the inspector of buildings of the city shall be *ex-officio* members.

John Thompson and Wm. Allen have gone into the plumbing and tinsmith business at Washington, N. J.

The California State Labor Congress has adopted a platform, including "the collective ownership by the people of all means of production and distribution," and has agreed not to support any political party that does not agree with it.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

Caswell & Moore, Phœnixville, Pa., are engaged in roofing a house and several outbuildings belonging to Wm. Sounden, at Diamond Rock. They also have a contract for plumbing Moore Hall, the summer residence of Judge Pennypacker.

George E. Berehns of Ivoryton, Conn., has secured the contract for doing the plumbing work on N. G. Post's new building.

The sundry civil bill, now pending before Congress, includes an appropriation of $90,000 for remodeling the ventilation and plumbing systems in the Post Office building at Washington.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until April 11, for the steam heating and ventilating plant for the United States Court House and Post Office building at Danville, Ill. Drawings and specifications can be had from the Supervising Architect at Washington or from the superintendent, Danville, Ill.

The Hoffman-Russell Company, 82 Lake street, Chicago, are to furnish the steam heating plants for the flat building of H. F. Wachsmuth, 3811 Rose avenue, and for the flat building of C. Steinmetz, 38 Elmwood place.

Among the contracts recently taken for steam heating by Cook & Chick, 253-255 Kinzie street, Chicago, can be mentioned the following: Flat building of G. A. Webb, 1441 Monroe street; residence of Frank Grundies, Rockwell and Augusta streets, and the 18-flat building of M. M. Brown, Forty-eighth street and Calumet avenue.

The Wells & Newton Company, 274 Dearborn street, Chicago, are overhauling the plumbing in the Calumet Building, La Salle and Adams streets. The Cooper Nautilus closets will be used.

The Kewanee Boiler Company, 96 Lake street, Chicago, have just taken contracts for four 66 inches by 16 feet tubular boilers with fronts, smoke stacks and breechings, to be used on sections of the great Chicago drainage canal, the contracts for which were recently let. The company report that general business is improving, with indications of a good spring trade.

J. H. Moses, Croton Falls, N. Y., has purchased the tin and plumbing business lately carried on by A. B. Whitlock & Co. He recently visited New York, where he was the guest of George Butcher of Southard, Robertson & Co.

The City Council of Easton, Pa., passed an ordinance at a recent meeting granting to the Model Heating Company of Philadelphia the contract to erect a hot water heating plant in the Central station for $605; to erect a steam heating boiler with a Silaby automatic attachment at engine house No. 2, to the American Fire Eugine Company of Seneca Falls for $450; to the Easton Heating & Ventilating Company (Rohn & Ellicott) the contract to erect a hot water heating plant at engine house No. 3 for $412, and appropriating $1467 for the purposes named.

The Weymouth, Mass., authorities have appropriated $2500 for heating apparatus for the Hunt school.

J. R. Morris & Sons, Houston, Texas, have been awarded the contract for the plumbing and electric light wiring in a public building of that city, amounting to $4924.

James Cleland & Sons of Lynchburg, Va., have been awarded the contract for ventilating the new State Library building in Richmond, over bidders from New York, Philadelphia, Richmond and other big cities. T. B. Dornin & Son furnish the galvanized iron needed in fulfilling the contract. The amount received for the entire work will be nearly $10,000.

Bids will be received by the Board of Education of Detroit, Mich., up to April 3 for the heating and ventilating apparatus for three school houses to be erected in that city.

A. C. Hickey, 69 South Clinton street, Chicago, is doing the plumbing and gas fitting in the extension to the Hub Building, State and Jackson streets.

M. L. Mandable, 258 Clark street, Chicago, has the contract for the plumbing, sewerage and gas fitting in the flat building of P. Ryan, 491 North Clark street.

Lingenfelter & McClintock, Austin, Ill., have the contract for heating the flat building of Dr. Kearsley and Miss Isgrig, using the United States Heater Company's No. 306 Capitol hot water heater for the purpose.

The Kelly & Jones Company, 48-52 North Clinton street, Chicago, are to install a hot water heating plant in the residence of William H. Reed, Prairie avenue and Twentieth street.

NEW PUBLICATIONS.

American Plumbing. A complete compendium of practical plumbing from solder making to high class open work. By Alfred Revill. Size, 7½ x 5½ inches; 224 pages. Published by Excelsior Publishing House. Price, $2.

It is a well-known fact that the plumbing trade is more scantily supplied with literature than any other of the manual trades at the present day. The best books of the kind come from England, and as they treat of English practice they are of indifferent value in this country. It is, therefore, always welcome news to hear of the publication of a book relating to American practice. The present volume is not a particularly exhaustive treatise, but nevertheless it contains much information that will be useful to the young plumber who is anxious to advance himself in his chosen profession. Lead and Its Uses in Plumbing is noted in the beginning; then plumbers' tools are illustrated and described. Part V is given up to making joints and bends, the text being assisted by cuts. The next chapter, or part as it is called, is entitled Traps. Then come Soil Pipes, Sewer Connections, Vents, Water Closets, Sinks, Closet Cisterns, Bathtubs, Washtubs and Kitchen Boilers. A complete drainage job is described in Part XVI, which is followed by the plumbing regulations, taken from the publications of the Health Department of the City of New York. An alphabetical index at the end facilitates reference to the contents.

The United States Patent Office is now less in arrears with its work than has been the case for the past seven or eight years.

TIN PLATES.

Meurer Bros. Company's Tin Plate Works.

The new tin plate plant of Meurer Bros. Company, 575–577 Flushing avenue, Brooklyn, N. Y., to which allusion was made in these columns some weeks ago, is so far advanced that the first two tinning pots were put into operation on March 9. The initial product turned out—a roofing plate of Worcester grade—proved eminently satisfactory, and the works will run regularly from now on. The two machines already at work are of the Phillips pattern. Two others, of the Thomas & White pattern, will be installed in the course of a few days, and will be used for the production of bright plates. It is expected that at least six tinning machines will be in active operation day and night by the end of the present month, when the works will be fully equipped in all other respects. The full complement of tinning pots contemplated is ten, but the last four are not yet ready for installment. At present, while working one shift only, an output of 80 boxes of 20 x 28 roofing plates a day is made. This will be increased to 50 boxes per pot, as the men become more expert, and when they have the aid of the cleaning and dusting machinery now on its way. Eventually, it is hoped, with the aid of the full force of ten pots, to reach an output of 1000 boxes a day of 24 hours.

Messrs. Meurers' plant is excellently planned and equipped with the most modern and efficient labor saving devices. A steam pickling machine and steam squaring shears have been ordered, as well as a steam stamping machine for the manufacture of some of the tinned goods dealt in by the firm. Nothing but American black plates are used; and it is the intention of the firm to ultimately establish a rolling mill themselves for the production of this material. All the workmen are Americans, Messrs. Meurer being anxious to make the tin plates turned out by them unquestionable American products.

SCRAP.

According to a German official report from Bilbao, Spain, a tin plate works which was started in that city about seven years ago, and which for a long time had a hard fight for existence, is now in full swing. It is said to be seriously affecting the foreign trade with Spain in tin plates.

Although some of the largest tin plate works in Wales are entirely closed, and many of the smaller establishments are also idle, the output of tin plates is evidently in excess of the demand, while prices are unremunerative. The stock of plates in warehouses at Swansea, Wales, awaiting foreign shipment is about double the amount usually held at that port.

The Welsh tin plate makers have jointly taken up the 36-box question. At a meeting held recently a sub-committee was appointed to confer with the leaders of the workmen, with the object of increasing the make all round to 40 boxes per shift. Should this not be agreed to, it is intimated that a general reduction of wages will follow. Several more works have closed down on account of the adherence of the men to the 36-box rule.

British tin plate manufacturers are tiring of the delay and suspense in settling the tin plate tariff for the United States. The *Iron and Steel Trades Journal* of London believes that "if it were definitely announced that no reduction would be made in the duty on tin plates, the Welsh trade would at once revert to a state of comparative activity on account of American buying." There is no doubt that it is the uncertainty that is killing the trade at present.

Kahn Bros.' Tin Plate Works, at 525 East Nineteenth street, New York, were again put into operation on Thursday, March 22. The plant has been idle for a month owing to the inability of the firm to obtain enough American black plates, which they use exclusively. Messrs. Kahn are making roofing plates. Their brands are known as Mohawk, Juniata and First New York.

The Laufman Tin Plate Company, with works at Butler Junction, Freeport, Pa., send out circulars giving lists of the brands of plates they make, with tables of sizes, gauges, &c; also a few particulars regarding the quality of the plates. On the same sheet is printed a number of testimonial letters, recording the opinions of those who have used the plates. A second circular relates to Laufman's Apollo terne or leaded sheets, which are described as coated with a mixture of tin and desilverized lead, hand double dipped and oil finished, and are said to be adapted for car roofing, eave troughs, conductor pipes and cornice work.

From Gas City, Ind., comes the somewhat remarkable but, considering the times, very encouraging statement that skilled labor is scarce at the tin mills, the class of labor referred to being tin mill heaters. From the same source we learn that the Norwood tin plate plant is growing continually and the work of adding new mills is being pushed rapidly.

According to the statement of imports and exports of the United States for January, 1894, prepared by the Bureau of Statistics in Washington, the value of tin and terne plates and taggers' tin imported during the first seven months of the fiscal year 1893-94 was $6,874,896. The average of the five corresponding periods of seven months, from 1888-89, was $10,330,010, consequently the imports for 1893-94 as above exhibited show a falling off of $3,455,114 in value. As compared with those for the seven months ending January 31, 1893, the decrease this year was $2,286,594.

The Tariff bill, as amended by the majority of the Senate Finance Committee, has been finally laid before the Senate. Among the changes that have been made since it was reported from the House is the reduction of the duty on tin plates to 1 cent per pound instead of 1⅛ cents per pound as in the House bill. The reduction in the present reading of the bill is to take effect October 1, 1894.

"What is Tin Plate?" is the title of a dainty 16-page pamphlet issued by Hibbard, Spencer, Bartlett & Co. of Chicago. The publication, which is the work of H. B. Lyford, manager of the tin plate department, explains in very lucid style how tin plate is made, sets forth the differences in quality and on what such differences are based, and leads the reader up naturally to a contemplation of the merits of the H. S. B. Old Process and H. B. L Old Style ternes or roofing plates offered to the trade by Hibbard, Spencer, Bartlett & Co.

NEW PUBLICATIONS.

The Art of Coppersmithing. A Practical Treatise on Working Sheet Copper into all Forms. By John Fuller, Sr. Size, 10 x 6½ inches; 327 pages. Published by David Williams, 96-102 Reade street, New York. 1894. Price, $3.

Our readers will recognize from the above description a work prepared as a serial that appeared in *The Metal Worker*, the final chapters being published last year. The author is thoroughly conversant with his handicraft, as those who followed the series can testify. The work of coppersmithing, although filling so important a part among the trades, has never been described and this volume will be welcomed by the coppersmithing fraternity. The early part is the record of the apprenticeship of the author, and shows how he was advanced step by step from the simplest beginning to the more complicated operations. The body of the book, however, is given over to practical descriptions of the methods of making all sorts of articles from copper, and many of the articles described admit of slight variation to adapt them to any patterns that may be in fashion at different times or in different countries. A special feature of the work to which we would direct attention is the engravings, of which there are nearly 500, illustrating different devices, methods of working, patterns, various stages in the construction of the articles, tools, appliances, &c.; in fact, the whole subject is presented through these illustrations so comprehensively that the pictures would almost form an intelligible work by themselves. The book proper, that is, the text, is, however, in excellent keeping with the cuts. The style is simple, and what is all-important in a work of instruction, the author tells from his own experience in the plainest way, so that any apprentice or novice can follow out his instructions. It is not a book that was written by the author merely to sell, but it was worked out from the experience of one who had learned by hard labor every step in coppersmithing work, and who belongs to that body of conscientious writers who try to state things accurately.

THE RETAIL STORE.

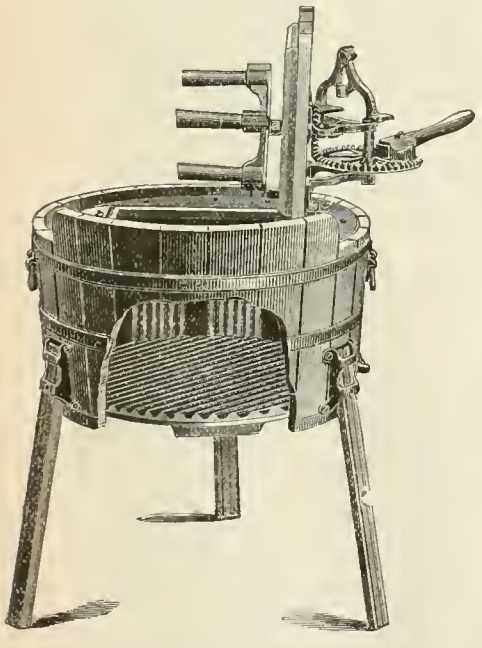
Marketing Goods Without Travelers.

From a well-known hardware house in the Southwest we have the following communication in which they refer to what they regard as one of the causes of irregularity in prices and other annoyances in connection with business: We have always contended that there is an overproduction of goods and that the drumming business is overdone, and is, to a great extent, the cause of demoralization and corrupt methods of doing bussness as practiced at the present time. We received to-day from a large manufacturer a circular which reads as follows: DEAR SIR: After carefully considering our mutual interests, we have decided to discontinue the expense of transacting our business through traveling solicitors, and give to our valued customers the advantage of the saving in expense by making a proportionate reduction in prices to our established trade. We recognize that the time has arrived when the most economical methods for conducting business must be adopted in order to furnish goods to dealers and consumers at the lowest possible price that will afford any margin of profit, and we feel confident that the trade will fully appreciate the advantages we are able to extend by dealing with them direct.

Our correspondents add that they predict this announcement to be the forerunner of many more.

The Bruner Washing Machine.

The accompanying cut represents a cedar washing machine put on the market by the Bruner Company,

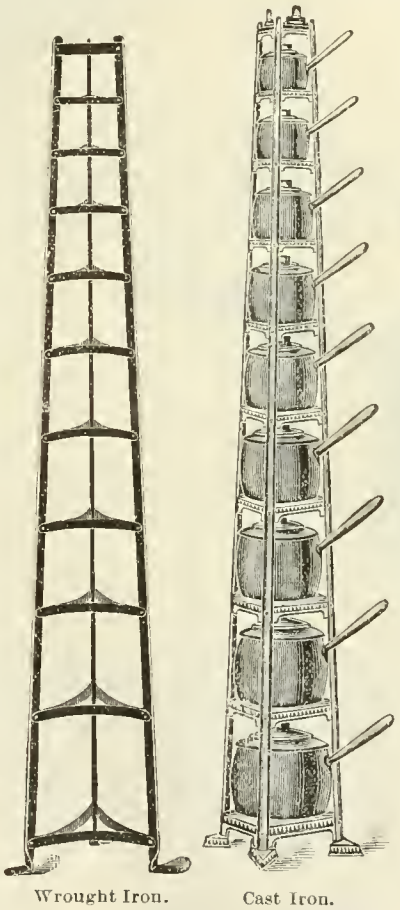


The Bruner Cedar Washing Machine.

Springfield, Ohio. The manufacturers state that the principle upon which the machine works is the expanding of the meshes of the goods washed, and that by the united action of condensed air, steam and suds the material is cleansed quicker than by other processes. The point is made that the corrugated bottom and corrugated breakers slush the water rapidly; and that after washing two hours in warm weather the hands cannot be held in the suds. The machine is made in styles A, B and C.

Saucepan Stands.

Silver & Co., 304-310 Hewes street, Brooklyn, and 20 Warren street, New York, are offering saucepan stands



Wrought Iron. Cast Iron.

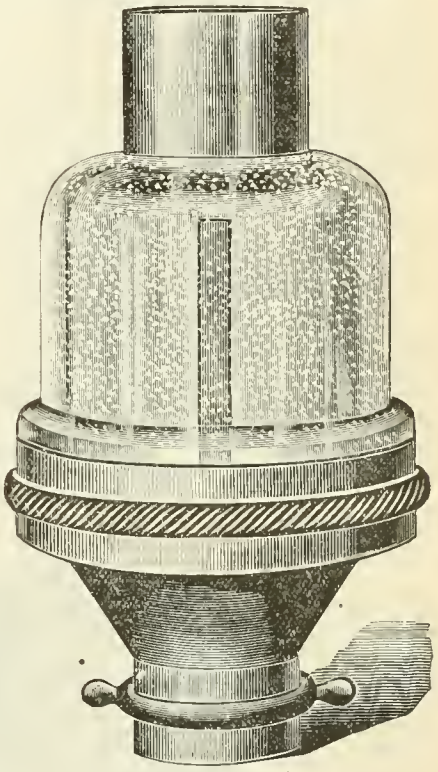
Saucepan Stands.

made of both wrought and cast iron, as illustrated herewith. They are referred to as strong, and handsomely japanned, and are designed for displaying saucepans as in Fig. 2; also deep and shallow pans and kettles. The point is made that the stands keep the utensils tidy and free from harm, and that an effective display is thus made of all sizes.

THE BUSINESS CARD of W. F. Adams, Toledo, Ohio, calls attention in a graphic way to the advantages of having stoves put up by an expert. It shows a worthy old couple struggling with an obstreperous stove pipe, which "Adams, the expert, could arrange for them in short order and thus save bad words, sleepless nights, family quarrels and perhaps a divorce suit."

The Clean Out Filter.

The Phillips Mfg. Company, 219 East Thirty fourth street, New York, are manufacturing the Clean Out filter, shown in the illustration. It con-



The Clean Out Filter.

sists of a cylinder of glass or nickel plated brass filled with fine quartz. The top section is made to fit either the New York or Pittsburgh standard hose bibb. The lower section has a rotating sleeve, to which are attached upright standards that reach nearly to the top of the cylinder, with a deflector plate at the top and having a strainer at the bottom. In use the water strikes the deflector and scatters instead of making a passage through the center. After the filter has been used for a time and become foul the rotating sleeve is operated, which thoroughly stirs the quartz; then by opening the faucet the quartz can be washed clean.

Embossed Mug.

The accompanying cut shows an embossed tin mug of handsome design,

Embossed Mug.

which Matthai, Ingram & Co. of Baltimore, Md., are putting on the market. It has a swell bottom, turned wire edge, square tin handle, and is very attractive in appearance. The mugs are sold at a low figure and are meeting with an excellent demand.

The Silver Cooking Crock.

The accompanying illustrations represent a cooking crock, offered by Silver & Co., 304-310 Hewes street, Brooklyn, and 20 Warren street, New York. As shown in Fig. 1, the crock

Fig. 1.—Cooking Crock.

is of porcelain, with a heavy tin cover, which when placed on the crock and given a turn will be securely locked in position, so that the crock may be carried by the cover handle. The crock is placed inside any covered vessel, such as an iron or tin saucepan or tin bucket, the outside vessel being partially filled with water and the crock containing the food to be cooked. Fig. 2 represents a vessel supplied by the company, or crocks may be purchased separately. The crock is designed for cooking cereal foods, milk, soups, vegetables, fruits, meats, &c. The manufacturers claim that with the use of the crock stirring is unnecessary, burning impossible, and that the crock preserves the nutritious juices and delicate flavors, making the food appetizing and satisfying. The crocks are made in 1, 2, 3 and 4 quart sizes.

Fig. 2.—Cooking Crock in Use.

Perfection Hammock Rope Adjuster.

Covert's Saddlery Works, Farmer, N. Y., are offering a hammock rope adjuster, as shown in Fig. 1. It consists of links, two of which are open, through which the hammock rope is passed, as in Fig. 2. The manufacturers claim that the device is safe and quickly adjusted, and that the construction is so simple that a child can operate it as well as a grown person.

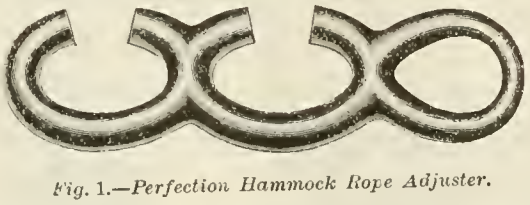


Fig. 1.—Perfection Hammock Rope Adjuster.

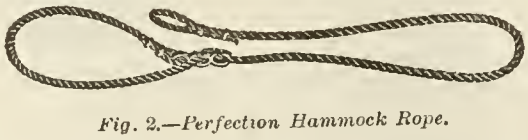
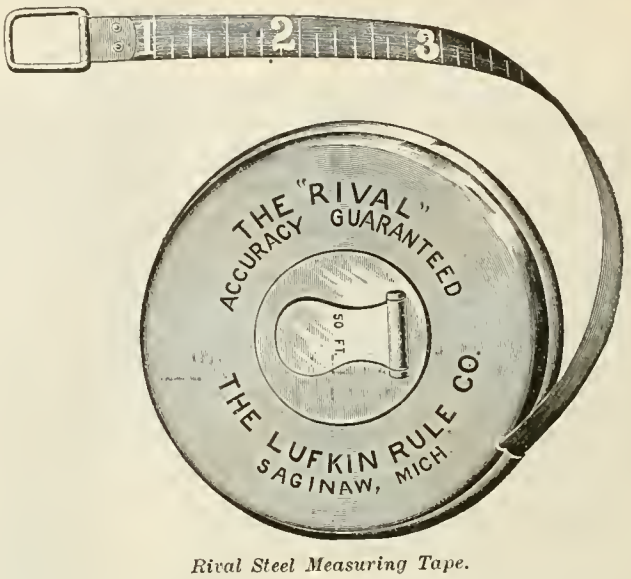


Fig. 2.—Perfection Hammock Rope.

Rival Steel Measuring Tape.

The Lufkin Rule Company, Saginaw, Mich., are offering the steel measuring tape illustrated herewith. The tape is marked only on one side in feet, inches and eighths. The case is deacribed as being brass, nicely nickel plated and as compact and durable. The winding drum is of somewhat larger diameter than the company's Reliable tape, which gives a good long crank and winds easily, notwithstanding it has not the advantage of an extension handle, but the handle folds nearly flush with the case. The tape is put on the market to meet the demand from contractors, builders, masons and others who appreciate the value of a steel measuring tape and who do not feel inclined to invest in the higher priced article. The manufacturers state that while the tape is sold at a comparatively low price yet none of its practical features have been in any way sacrificed and that it is a first-class article, and is fully guaranteed by them.



Rival Steel Measuring Tape.

Billing Gasoline Stoves.

From F. B. K., *Delaware, Ohio.*—I would like to ask retail dealers handling gasoline stoves if the manufacturers all over the country are doing with them as they are with me, or rather as they are trying to do, as I have so far refused their requests. I order gasoline stoves without ovens and they make out the bill as follows:

A No. 22 stove	$20.00
Less 30 per cent	6.00
Total	$14.00
Deduction for oven	2.00
Total	$12.00

making the stove cost $12, where it ought to be $11.20. Then if you buy ovens, they are listed $4, less 30 per cent., making them cost $2.80. I do not understand what the manufacturers mean by such business. We can buy ovens of outside parties and if the manufacturers cannot sell ovens as cheaply as the outsiders they should confine their sales to stoves. They have no right to compel a man to buy what he does not want, nor have they any right to ask a man to pay for what he does not get. If the manufacturers' association is organized for such a purpose, the sooner it disbands the better, in my judgment, it will be. I am told that the above is the rule. If the retail dealers allow such a thing with gasoline stove manufacturers, how will it be with the manufacturers of other stoves? They might say, if you buy a cook stove of us you must buy the pipe and trimmings. If you don't, we will charge the profit on the pipe and trimmings any way, so we don't care whether you buy them or not.

E. M. ALLEN, 114 Franklin street, New York, is introducing among dealers in House Furnishing Goods Aluminum Cooking Utensils and other vessels made by the Illinois Pure Aluminum Company, Lemont, Ill. This material, which is continually being utilized for numberless purposes, is referred to in connection with culinary articles as free from poisons, unaffected by medicinal acids, durable, clean, light, and not liable to tarnish.

Architects and others who keep in advance of the times insist, says the Philadelphia *Record*, that stone will be more extensively used next season than ever before for residences, the craze for mottled and colored bricks being on the wane.

STOVE TRADE NOTES.

Cupola Management.*—VIII.

BY DR. EDWARD KIRK.

Poking the Tuyeres.

When the blast is first put on the fuel in front of each tuyere is bright and hot, but it is soon chilled and blackened by the large volume of cold blast passing in, and the tuyere presents the appearance of being closed up and admitting no air to the cupola. The blast when first put on does not remove the fuel and make a less opening in front of each tuyere to get into the cupola, but works its way between the pieces of fuel in front of the tuyeres, and these openings remain open for the passage of blast after the fuel becomes cold and black. The blast, therefore, passes into the cupola just the same as when the fuel was hot, and it is not necessary to poke the tuyere with a bar or break away the cold fuel in front of each tuyere to let the blast into the cupola.

Toward the end of a long heat slag and cinder settle and chill at the bottom of a cupola, and often not only close the blast off at the tuyeres but prevent it passing freely through the stock and out at the top. If the tuyeres are poked at this stage of the heat an opening may be made well into the stock. But in working the bar around in forming this opening most of the natural passages the blast has made for entering the stock are closed up. The new opening is only a hole bored into a tough slag or cinder from which there is no way for the blast to escape into the stock, and less blast enters a cupola after the tuyeres have been poked and opened up than entered before. The only time a tuyere should be poked with a bar is when cinder or slag has lodged or formed in front of it in such a way as to run a stream of molten iron into the tuyere. The tuyere door should then be opened and the slag or cinder broken away with a bar to prevent the iron running into the tuyere.

Fuel.

Ten pounds of iron are melted with 1 pound of anthracite coal and 15 pounds of iron are melted with a pound of Connellsville coke. But this melting is done in the foundry office or in the mind of the foreman, and it takes a little more fuel to melt iron in a cupola for foundry work. Six pounds of iron to 1 of anthracite coal and 8 pounds of iron to 1 of Connellsville coke is considered good melting by practical foundrymen. A little better than this can be done in a full heat for the size of the cupola and under favorable circumstances, but in the majority of foundries less pounds of iron are melted to 1 of fuel than the above amount.

It is sometimes necessary for the melter to put in a few extra shovels of fuel when the bed has been burned too much before charging, or to level up the charges when two or three men are shoveling in fuel at the same time and get it uneven. The melter is generally blamed if the iron comes dull from any cause, and he will generally put in a few extra shovels of fuel the next heat to make it hot, and if the iron does come hot the next heat the extra shovels are put in every heat, but are not put on the cupola report. In this way foundrymen are often misled by the cupola report and suppose they are melting more pounds of iron to the pound of fuel than they really are. The only way the foundryman can know exactly how many pounds of iron he is melting to the pound of fuel is to have an accurate account kept of the amount of iron melted and compare it with the amount of fuel bought and delivered for the cupola, after deducting from it any amount that may have been consumed in stoves or coke ovens.

I recently met a foundryman who thought he was melting 14 pounds of iron to the pound of fuel, but when he came to compare the iron melted with the fuel bought and delivered for the cupola he found he was only melting about 7 pounds of iron to the pound of fuel, and about the same results would be found in every foundry that is melting a very large per cent. of iron to fuel. There is nothing gained by saving a few cents' worth of fuel in the cupola and losing a dollar's worth of work on the floor by dull iron, and there is nothing gained by using too great a quantity of fuel, for too much fuel in a cupola makes dull iron as well as too little fuel.

Iron is not melted in a cupola for the fun of melting it or to learn how many pounds of iron can be melted with a pound of fuel, but is melted to make castings. What the foundryman wants from the cupola at the tap hole is an iron hot and fluid enough to make a sound casting regardless of the amount of fuel required to produce it. As before stated, iron cannot be melted hot and fast in a cupola with either too much or too little fuel, and foundrymen have only to melt their iron as hot and fast as iron can be melted in a cupola of the size they are using, to know that they are not using either too much or too little fuel in melting.

If the foundryman will ask his neighbor what is the size of his cupola, how many tons does he melt per hour, how long does it take him to run off a heat, he will get a better guide to run his cupola by than if he asks him how many pounds of iron he melts to the pound of fuel As soon as the founder undertakes to imitate his neighbor and do faster melting or get better results from his cupola, he will hear the old, old story from both melter and foreman: "We haven't enough blast." More cupolas have too much blast than too little, and the apparent deficiency of blast is due in the majority of cases to too much fuel in the cupola and the iron being melted only on the upper edge of the melting zone. It does not make any difference how much or how little blast a cupola has. If it is given an even volume of blast throughout the heat, the cupola will melt a stream of iron of an even size and temperature throughout the heat except toward the end of a long heat, when the stream may get smaller. If the melter cannot run this kind of a stream from his cupola with an even blast, then he is at fault, and neither the blast, nor too much fuel is the cause of the uneven melting.

I have watched the charging of cupolas in a great many stove and machinery foundries, and as a rule more fuel is consumed in making dull iron in a machine foundry than is consumed to make a hot iron in a stove foundry. This is simply because hot even iron cannot be produced with bad working of a cupola and too great a quantity of fuel, and the stove founder must have his cupola properly worked or he cannot use the iron to pour the work.

Tapping Bars.

The tapping bars are made of round iron of from ½ to 1 inch diameter and are from 3 to 10 feet long. The hand bars are made with an oval ring at one end to serve as a handle for rotating and withdrawing the bar when tapping. The other end is drawn down to a long sharp point for cutting away the bod and making the tap hole. The bars for sledging are made straight with a long sharp point at one end. This bar is only used in case the tap hole becomes so tightly closed it cannot be opened with the hand bar, and seldom more than one is provided for a cupola. From three to six hand bars are provided for each cupola, and when the ladles are all of the same size the tap bars are all made of the same size, except one or two small ones which are provided for clearing the hole of any slag or dirt that may be carried into it by the iron.

When the iron is melted for different sized work and large and small ladles are used, the bars are made of different sizes, so a large or small hole may be made to suit the tap to be made or ladle to be filled. The bars are all made straight except when the tapping is done from the side of a long spout. They are then slightly curved near the point, so the hole can be made in a line with the spout. The bars are dressed and pointed at the forge before each heat, and are given any shape of point the melter may fancy. A square point cuts away a bod very rapidly when rotated and leaves a nice, clean hole, but it is very difficult to keep a point square, for they generally become round after a few taps have been made and they come in contact with the molten iron a few times. For this reason they are generally made round at the forge.

Some melters have a short steel bar, with a sharp flat point, which they use for cutting away the bod before tapping, but never use it for opening the hole. This they do to remove the greater part of the bod from the spout before tapping, and prevent it getting into the ladles. A hammer and an anvil, or an iron block, should be placed near the cupola for straightening the points and breaking cinder or dross from the bars, and a rack should be provided within easy reach of the tap hole, in which to place the tap bars on end until wanted for use. There is nothing more slovenly and dangerous about a foundry than to have the tap bars lying around the floor when a heat is being run, and

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it is just as bad to set them up against a post from which they are all the time falling down.

The Gasoline Stove Trade.

A correspondent writing from the West calls attention to certain practices in the gasoline stove trade that deserve the serious attention of the retailers. His letter is as follows:

Two questions are now agitating the manufacturers of gasoline stoves. The first is the smallness of the orders being received by them, and the other is the cancellation of orders for stoves already placed. Treating the first complaint from the manufacturers' standpoint, we find that many concerns who have heretofore ordered in large quantities, some even being carload buyers, are now taking one-half to one-third of the amount ordered last year, yet the difference in the total number sold by retailers this year is not likely to be very much, not more than say 10 per cent. Dealers, however, are sending in orders that are 25, 50 and even 60 per cent. less than last year. When the active demand sets in the retailer will find himself short of stock, and will send in his order requesting immediate shipment. Right here is the important point. He cannot secure immediate shipment, as gasoline stoves are not made in a day, and should the demand prove greater than last year there will be a great many disappointed retailers throughout the country. Gasoline stoves have now reached a point of practical perfection so that they can be carried over from one year to another without losing their value, and it is only justice that the dealer should bear his share of the burden.

Cancellation of orders is the second complaint made by manufacturers and is one of the most aggravating annoyances with which they have to contend. As early as October, or immediately after the use of gasoline stoves is discontinued for the season, the manufacturers send out their traveling men, who book orders for delivery say six to eight months ahead. After the first of the year the manufacturer looks over his order book and calculates how many stoves will be required to fill his customers' wants. On the basis of the orders thus received he places his orders for material to be used in the manufacture of his stoves, such as tin plate, sheet iron, brass, bar iron, screws, rivets and other materials too numerous to mention. After making all the necessary arrangements for turning out so many stoves, cancellations begin to arrive and continue throughout the season. It would be far better not to order a stove rather than order 100 and then cancel 75 of them, which is very often done. Dealers evidently do not stop to think of the vast amount of trouble and expense to which they put the manufacturers, else many of them would cancel fewer orders than they now do. The manufacturers keep a record of those who make a habit of canceling orders, and as gasoline stoves are now sold by nearly all manufacturers to only one dealer in each town, whenever an opportunity presents itself these dealers are dropped and other agents appointed. Thus the dealer not only injures the manufacturers' but his own business at the same time. This is a question on which it would be well for the dealers of the country to ponder, and the more they study it the more pronounced becomes the justice of the manufacturers' complaints as outlined above.

ODD PLATES.

The Lehigh Stove & Mfg. Company of Lehighton, Pa., send us circulars of the Gem-Lehigh five hole range, made in three sizes, and also of the Lehigh, another five-hole range offered in three sizes. The former construction is fitted with anti-clinker grate, top end shelf, broiling door, illuminated wood door and nickel trimmings. Accompanying the circulars is a folder entitled "Lo, the Poor Indian." On opening it we find the following, in which our readers may be interested, outside of its reference to Lehigh stoves: "Hasn't been so very long since the wild Indian roamed our valley, and as he shot his canoe under the shadows of our mountains he called the stream 'Lehigh' — black water. How little he knew the future of that name in the coming century! The age of steam and of iron, of education and of luxury was coming, and the steam was to be made from Lehigh coal; the railroads and locomotives and factory wheels were to be made of Lehigh iron; a million boys of the nineteenth century were to do their sums on Lehigh slates; and in 10,000 happy homes the twilight shadows would find the family gathered around a Lehigh stove. Alas, poor Indian! How little he knew!"

The Mobile Stove and Novelty Works of Mobile, Ala., have been organized. E. E. Posey, G. Heidel and Jas. K. Glennon are the incorporators.

The annual meeting of the stockholders of the March-Brownback Stove Company, whose extensive works are at Pottstown, Pa., was held at that place last week, under the chairmanship of A. G. Saylor. The following officers were elected: President, James Brownback; vice-president, James Rogers; treasurer, T. J. March; secretary, H. M. Ebert; directors, James Brownback, Franklin March, T. J. March, James Rogers, John H. Towers, A. K. Shaner, Henry G. Kulp.

Duparquet, Huot & Moneuse, 43–45 Wooster street, New York, manufacturers and dealers in fine hotel and kitchen supplies, are now installing the cooking ranges and similar appliances in the rooms of the Hardware Club in the new Postal Telegraph Building, Broadway and Murray streets. They expect to have their part of the kitchen battery finished by April 1.

The foundry of the Bussey & McLeod Stove Company, Troy, N. Y., which has been shut down for several months, resumed operations last week with a full force of 250 men.

The first cast for some time was made during the past week in the foundry of Burdett, Smith & Co., at Troy, N. Y.

L. G. Comparet of 314 Walnut street, Des Moines, Iowa, is offering the trade a full line of steel ranges adapted for family use. The bodies of the stoves are made of heavy steel, well lined with asbestos, while the tops and all castings are of the best grade of iron. Other features include sectional fire back, large ash pan, dumping and shaking grate, side hopper feed and capacious oven. The claim is made that the flues are so constructed as to regulate the heat of the oven to any degree desired. The range is known under the name Alta, and is referred to as being especially adapted to the use of Western fuels. It is made in two sizes, one having four boiler holes and the other six. Mr. Comparet also makes the Pioneer range in six different sizes, adapted for large families and hotel use.

The differences existing between the Schuylkill Valley Stove Company of Spring City, Pa., and their employees, by which the works were closed for a time, have been amicably adjusted and the plant started up during the past week.

A. Weiskittel & Son of Baltimore, Md., have issued a very neat catalogue of over 50 pages, relating to the Fire King gas stoves and ranges. The opening pages are devoted to testimonials, following which the goods named are illustrated and described in such a way as to emphasize the special features. In addition to the various kinds of Fire King gas stoves to which attention is invited may be mentioned ovens, sadiron heaters, tailors' iron heaters, baking plates, &c. Some remarks are given as to the reasons why gas should be used as a fuel, while a telegraphic code and comprehensive index constitute interesting features. The volume is neatly bound in colored paper covers, with side title embossed in two colors upon a black ground.

The grievance of the mounters employed by the Reading Stove Works, Reading, Pa., appears to have grown out of the price fixed upon for mounting a new range recently put in the sand. We understand that the company offered a piece price for mounting the range which is claimed to be higher than the price paid for mounting any other range of its class in Eastern Pennsylvania. The offer was considered liberal and that the men would be able to earn good wages at the figure. The mounters, however, differed in their view of the matter and went out on strike, which compelled the company to close their mounting department. It is expected, however, that the differences will soon be adjusted.

The Barstow Stove Company of Providence, R. I., are distributing colored circulars calling attention to the Bay State goods which they manufacture. A representation is given at the left of a train of cars, while at the right is a large black star. The statement is made that the "Bay State express is the best train to take between our Boston, Providence and New York houses, and we are daily shipping Bay State ranges and stoves over the same rails. The equipment of the Bay State express train is perfect. It runs smoothly and makes fast time. So is the workmanship of the Bay State goods perfect—they sell easily and rapidly. If you want to know more about it light a piece of cotton twine and apply a spark to the smoke stack of the locomotive and also to the star. The smoke will tell the story." Following the suggestion and applying the spark to the paper results in the burning in it of the words "Bay State Line."

It is stated that the Florence Stove Works of Florence, Ala., which have been idle for some time past, have been purchased by parties who will convert them into a plant for the manufacture and repair of machinery.

The Standard Lighting Company of Cleveland, Ohio, report their sales of New Process vapor stoves up to the present time as a trifle more than 50 per cent. in excess of the sales for the corresponding period of last year. They attribute this increase to the growing popularity of the evaporating stove, which has been much improved for the

season of 1894. The company also report collections good and the outlook healthy.

THE ANNUAL STATEMENT of the Employees Mutual Benefit Association, the members of which are employees of the Michigan Stove Company, show the receipts for the year ending February 24, 1894, to have been $3242.13 and the disbursements in the way of benefits and expenses $1231.98, leaving cash on hand $2010.15. The association has been in existence since May 12, 1882, during which time the sum of $16,911.85 has been disbursed in the way of benefits. The association is supported entirely by a system of dues contributed by the members.

AT THE ANNUAL MEETING of the stockholders of the Fuller-Warren Company, Milwaukee, Wis., held early in the month, reports were presented showing a very satisfactory business during the past year. The election of directors resulted in the selection of Walter P. Warren, Troy, N. Y.; William Plankington, Francis Hinton, H. S. Haselton, George L. Graves, John E. Hansen and H. A. Viets, of Milwaukee, and G. Wolfe, of Troy. We understand that John Johnson was placed in the directory to succeed G. S. Mitchell, who was temporarily elected last summer to succeed A. W. Rich, retired. At a meeting of the directors Walter P. Warren of Troy was elected president; H. A. Viets of Milwaukee vice-president and manager, and C. W. Jones of Milwaukee secretary.

SOUTHARD, ROBERTSON & Co., Water street and Peck slip, New York, favor us with a four page circular of the Waldorf range, made portable or brick set. This is a new construction, heavy and durable, with large ventilated oven, patent adjustable extension flue strip for regulating the heat and draft in the bottom of the oven; extra heavy covers, one of which is composed of a series of nested rings opening to 3½ inches; patent oscillating or flat bottom grate, capacious ash pan, patent oven door opener and Read's patent damper. The range is made with 6-inch smoke pipe in the center, thus rendering flue connection easy. The Waldorf is offered with a skeleton closet, or full warming closet and sifting grate complete, as may be desired.

THE GLAZIER OIL STOVE COMPANY of Chelsea, Mich., are erecting an addition to their power house 15 x 54 feet in size. It is of brick and one story in hight. The front on Main street will for the present be used as an office and the rear for a storeroom.

THE EXTENSIVE stove works of Rathbone, Sard & Co., at Albany, N. Y., have resumed operations and are now running with a full force of men. The goods sold in the Eastern and Middle States are turned out at the Albany plant, while those sold in the West are manufactured at Aurora, Ill The company refer to the extent of their Albany plant, which, before the establishment of the works at Aurora, comprised five cupolas, and now still turns out a very large stove product.

THE BRIDGE & BEACH MFG. COMPANY of St. Louis, Mo., are increasing their manufacturing facilities by the erection of a seven story building 50 x 225 feet in size, which will be used for storage and mounting purposes and fitted with all necessary modern machinery and appliances. The company are also adding a new molding room and rearranging the rest of their plant in such a way as to give them a stove foundry which will rank among the most complete and best arranged in the country. They expect to have the improvements completed and the entire plant in full operation by June 1, when they will be prepared to keep pace with the large and growing demand for Superior stoves and ranges. Several new patterns of cook stoves, ranges and heaters are in preparation and the goods will be brought out as rapidly as possible. The company state that they have accumulated a large and well assorted stock and are in a position to promptly fill all orders with which they may be intrusted.

F. MEYER & BRO. COMPANY, with office at 1313 South Adams street and works at 1300-1304 South Washington street, Peoria, Ill., have just completed extensive alterations by which their manufacturing capacity is largely increased. About a year ago the company purchased outright the patent covering the Weir gas and soot consuming furnace, and the demand for it has increased to such an extent that the improvements noted were found necessary. The statement is made that this furnace consumes soot and gases, is gas tight and does not admit any smoke into the house. The heater is made of steel. Frank Meyer, the originator of the enterprise, has been in business for over 27 years, the firm being known for a time under the name of Meyer Bros., and about two years ago the present company was incorporated.

SPICER STOVE COMPANY, Providence, R. I., are making additions and changes to their foundry in the way of increasing their manufacturing facilities. These changes are mostly in the line of rearrangement of old buildings and apartments and will add greatly to the convenience of the plant as well as to its size.

THE QUICK MEAL STOVE COMPANY, St. Louis, Mo., advise us that the total number of stoves sold by them this year up to and including the 19th inst. is just 4 per cent. less than for the same period of last year. This is a very creditable showing, and especially so when it is remembered that the first quarter of 1893 was the heaviest in the history of their business. They have just ordered the second edition of their gasoline stove pamphlet, consisting of 200,000 copies. The first edition was 750,000, so that the total edition will not fall much short of 1,000,000 copies.

THE regular monthly meeting of the Western Foundrymen's Association will occur on Wednesday, March 28, at 7.30 p.m., in rooms 702-703 Temple Court Building, corner of Dearborn and Quincy streets, Chicago, Ill. By request of the association W. J. Keep will present a short and very interesting paper on "Cupola Melting and Strength of Cast Iron."

SAM S. UTTER of 113 Beekman street, New York City, has been taking advantage of the fine spring weather in having his four story warehouse thoroughly renovated, and at present a large number of plasterers, carpenters and painters are busily engaged in the work. After the improvements have been completed a flagstaff 20 feet in hight will replace the old one and will be surmounted by a weather vane carrying a gold-plated rooster 4 feet tall. We understand that this weather vane will be so arranged that every day at exactly 12 o'clock the rooster will crow, the mechanism being operated by steam. Mr. Utter's counting room will be finished in a very tasteful and attractive manner, and the floor covered with Turkish rugs of rich design. Opening from the main office is to be a room for customers, provided with desks and stationery for letter writing. It is also intended that this room shall be used as headquarters for customers while in the city. Mr. Utter reports a good demand for his line of gas and oil stoves, and states that during the past week he shipped over 20 carloads to agents throughout the country.

J. B. COPP has tendered his resignation as manager of the Chicago branch of the Peninsular Stove Company of Detroit, Mich., to take effect April 1 of the present year.

News and Notes.

A recent order of the Treasury Department, permitting the unloading of vessels before entry, is much appreciated by importers, as saving a delay which is frequently costly and inconvenient.

A bill to extend the limits of the port of New York so as to include Yonkers, Westchester County, has been favorably reported by the House Committee on Commerce.

By the deepening and widening of the Eel River for a distance of 20 miles, several thousands of acres of low swamp lands in Indiana, now worthless, are to be reclaimed.

Eastern business from Cincinnati is to be pooled between the Pennsylvania, Baltimore & Ohio, Southwestern and "Big Four" railroads.

A Scandinavian Industrial Exhibition will be held at Malmö, Sweden, in 1896.

Two hundred tons of Harveyized steel armor plates for the U. S. monitor "Puritan" were shipped on Friday from the Bethlehem Iron Works.

Shipments of gold from South Africa in 1893 reached the value of $26,400,000.

The total war ship tonnage launched by the most active naval powers in 1893 was: France, 52,188; United States, 40,050; Great Britain, 28,920; and Russia, 17,320.

News comes from Australia of the discovery of some extremely rich gold fields in the colony of Victoria, near the old mining camp of Ballarat.

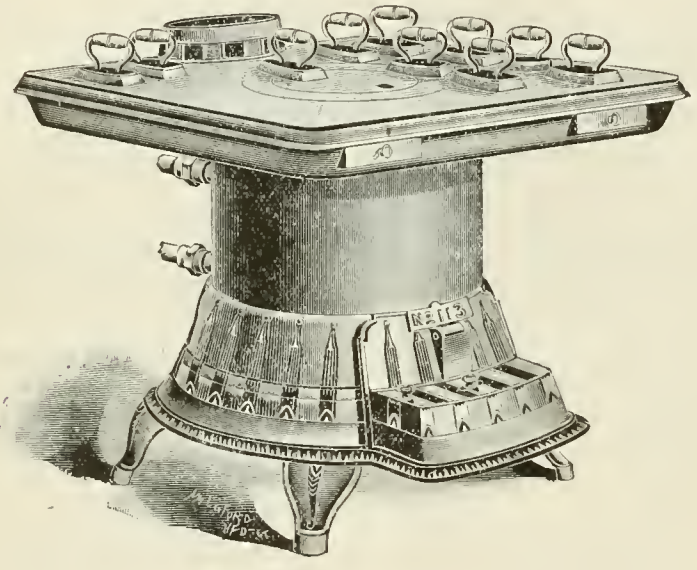
The New York factory inspectors find that during the year 1893 the proportion of child labor in this State has decreased from 38 per 1000 to 34 per 1000 of operators.

The project for a ship canal from Lake Superior to the Mississippi is receiving enthusiastic support in the Northwestern States. The scheme would, it is believed, prove a great benefit to the whole business of the West. Government engineers pronounce the plan perfectly practicable, and an appropriation of $10,000 will be asked for to determine the most feasible route.

The annual trade returns of the Dominion of Canada for 1893, just issued, show a volume of foreign trade $6,270,000 in excess of that of 1892, which was then the highest on record. The value of the imports into Canada last year was $129,074,268, and that of exports $118,564,352. The trade with the United States in 1893 amounted to $108,984,978 in value, as compared with $102,957,064 in the year 1892.

Richmond Laundry Range.

The illustration herewith shows a new laundry range, the Richmond, just being brought out by Higgins & Co., 379 Lexington avenue, New York. It is made in one size with a substantial base which contains an easy working grate and supports the upper parts. The fire chamber is furnished in three styles, tile lined, or one-third of it a water heater, or the whole as an annular water chamber, giving it a water heating capacity of from 60 to 150 gallons. The top rests on the fire chamber and has a capacity for heating 25 or 30 sad irons. It is arranged with a flue providing for the heating of all parts and has a check damper for controlling the draft. A large ring and cover are placed over the fire so that a kettle can be used if de sired. It is adapted for use in hotels, institutions and families where a large



Richmond Laundry Range.

quantity of hot water and a large number of hot irons are needed.

The Rusting of Iron and Steel.

The phenomena of chemical combination appear to be exceedingly complex. Not so very many years ago we were taught that a mixture of oxygen and hydrogen would combine to form water when an electric spark was passed through them. The matter appeared simple, was easily expressed in chemical formulæ, and illustrated by experiment. Now we have learned that it is impossible to make such a mixture explode when it consists of perfectly pure and dry gases. When, however, the slightest trace of moisture is present, the combination takes place at once, thus illustrating the importance of those "next-to-nothings" which were so ably and so pleasantly discussed by Sir Frederick Bramwell in his address to the British Association. The oxidation of iron, though a more familiar phenomenon, is at least as complex as that of hydrogen. In spite of the proverb, this familiarity has been very far from breeding contempt, as its commercial importance has attracted very considerable attention to the subject, and though there is still much to be learned, some few facts appear to be now established. In the first place, neither bright iron nor steel will rust in pure water or in pure air. The presence of carbonic acid, or some similar agent, seems necessary, although the final product may be destitute of carbon. Even when oxygen, moisture, and carbonic acid are all present, rusting will not, it appears, take place unless the moisture condenses on the surface of the metal. When rusting does take place under ordinary circumstances, the first atage appears to be the formation of ferrous carbonate. This carbonate is then dissolved in carbonic acid water to form ferrous bicarbonate, which latter is then decomposed in presence of air and moisture to form hydrated ferric oxide, magnetic oxide being formed as an intermediate product. This fact as to the formation of the magnetic oxide is curious, as the Bower-Barff process of protecting iron and steel consists in coating the metal with a firmly adherent layer of this very oxide.

Every one knows that when a bar of iron has commenced to rust the corrosion proceeds apace. A polished bar will resist oxidation for a comparatively long time, even under somewhat unfavorable conditions, but once the rust has commenced to form it does not take long for it to cover the whole of the bar. One reason for this may be the fact that the rust is electro-positive to the iron, but it is also partly attributable to the final product, the hydrated ferric oxide being only formed at the end of several intermediate stages of the oxidation, and to its hygroscopic properties, which favor the absorption of moisture from the air. In certain situations, other acids besides carbonic may take part in the corrosion of iron. The metal work in bridges over railways is particularly exposed to fumes, and some engineers consider that in such cases no plates less than ⅝ inch thick should be made use of, even in the case of the flooring.

The whole question of the rusting of iron and steel work has been discussed in considerable detail by Thomas Turner in a paper recently read before the South Staffordshire Institute of Iron and Steel Works Managers. It is now pretty generally acknowledged that, so far as ordinary exposure to the weather is concerned, iron is less liable to rust than steel. Unfortunately, however, this capacity for resisting rust seems to be greater in the common irons than in the best qualities, and has been attributed to the phosphorus contained in the former, which seems to have a protective action. When iron and steel are used in conjunction, there is no certainty which will be the more liable to rust. The potential difference of contact between the two is very small, and though in general wrought iron is found to be electro-positive to steel, there seem reasons for believing that this may not be so in all conditions.

W. Denny has instanced a case in which the steel shell plates of a vessel remained clean, while the iron stem plate and rudder forgings were much corroded. The ballast tanks of ships are particularly exposed to rust. Bilge water is an exceptionally powerful corroding agent and several engineers have suggested the use of iron plating in ships in those parts exposed to bilge water, even when the body of the ship is of steel. In steam boilers it is claimed that there is little difference in the behavior of the two metals, and certainly steel boilers, when properly looked after, have been proved to have a long life. Plates thoroughly cleaned from scale are less liable to corrosion than when used just as they come from the rolls, and the Admiralty have accordingly adopted the practice of pickling the plates before being used. In a case of pitting, Mr. John found a particle of black oxide at the bottom of each pit. Experiment shows that this black oxide is strongly electro-positive to the plates.

Cast iron seems in general to last better in sea water than either wrought iron or steel. Trautwine, however, relates that the cast iron cannons of the "Royal George" and the "Royal Edgar," after an immersion of 62 aud 133 years respectively, had become quite soft, and were in some cases like plumbago. A very similar experience was noted with the cast iron aluice gates of the Caledonian Canal. Much apparently depends on the quality of the iron. Trautwine recommends white, close-grained cast iron, while Mr. Turner quotes from a British Association report recommending gray iron.

The alloys of iron with nickel, cobalt and chromium appear less liable to rust than ordinary iron, while the presence of manganese appears to render the iron more sensitive to attack by corrosion.

Herr Lentz, in a paper read before the German Society of Engineers, makes the statement that there are 109,000 locomotives now in use in the world. He credits 63,000 to Europe, 40,000 to America, 3300 to Asia, 2000 to Australia and 700 to Africa. Of those used in Europe Great Britain owns 17,000 Germany 15,000 and France 11,000.

The total number of immigrants arriving at New York, Philadelphia, Baltimore and Boston during 1893 was 431,712. These comprise four-fifths of all the arrivals at American ports.

British Board of Trade returns for the month of February show an improvement in both imports and exports as compared with the corresponding month last year. The exports increased $2,832,000 and the imports $20,256,000.

The gratifying fact is noted by Dun's agency that the amount of failures in the United States during February was only $15,000,000, as against $30,946,000 in January, a decrease of more than 50 per cent.

TRADE REPORT.

The Iron Market.

The condition of the market has not improved within the past few days. Pig Metal is comparatively steady, but Billets and Finished Material are weak and depressed and hardly quotable on large lots. To make mattera still worse, the railroads are said to be cutting East-bound freights, with an intimation that the rate war has hardly commenced. It is claimed that $1.70 is accepted against a nominal rate of $2 30, and that before the end of the week business will be done at lesa than $1.70. The volume of business is not increasing to any appreciable extent, and although the demand is of a more general character, it is difficult for the mills to hold their own compared with the earlier months of the year. The reduced rates from the West will make the situation still more onerous, as it gives an additional advantage to mills in that section of at least 50¢ @ $1 ℔ ton. The only hope that the trade seem to have is that something unexpected will happen and thereby give things a turn which seems almost hopeless under present conditions.

Pig Iron.—While some of the furnace agents in New York report quite a fair volume of business, others find sales very slow. The lowering in rates of freight from the Mahoning Valley, amounting to 50¢ ℔ ton, places American Scotch from that section at closer prices here, say, $13 75 @ $14 for No. 1, and $12.75 @ $13 for No. 2. We quote standard brands $13 @ $13 50 for No. 1; $12 @ $12.50 for No. 2, at tidewater. Southern Iron, same delivery, $12.75 @ $13.25 for No. 1; $11.25 @ $11.75 for No. 2; $11 @ $11.25 for No. 3; $11.25 @ $11.75 for No. 2 Soft, and $11.75 @ $12 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10.50 @ $11.

Philadelphia advices state that the Pig Iron market in that territory is not materially different to what it has been for several weeks past, although the general movement may be a trifle larger. There is no change in prices, however, and anything that a buyer could have last week, or during several previous weeks, could just as easily be had today. On the other hand, there is no particular pressure to realize, so that matters drift along from day to day almost without a shadow of deviation. Under such conditions there is nothing upon which to base predictions of change, either favorable or unfavorable, but on the contrary the indications are all in favor of a continuance of the prevailing monotony for an indefinite period. General quotations are about as follows for Philadelphia and nearby points:

No. 1 Foundry	$13.00 @ $13.50
No. 2 Foundry	12.25 @ 12.75

In the Chicago market the great bulk of the business in progress consists of local Coke Iron. Transactions in this line appear to be growing larger and some good sized purchases are reported by the largest consumers. Small lots are in excellent request, and taken as a whole the volume of business is considered quite fair for the season. The output of Pig Iron in this locality has increased considerably within the past week or two. The demand for Southern Iron continues as light as heretofore reported and prices are weak. An occasional inquiry is noted for Lake Superior Charcoal, but actual business is confined to very small lots. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @	$15.25
Local Coke Foundry, No. 1	11.75 @	12.25
Local Coke Foundry, No. 2	11.00 @	11.75
Local Coke Foundry, No. 3	10.75 @	11.00
Local Scotch	12.00 @	12.50
Ohio Strong Softeners No. 1	13.00 @	14.00
Southern Silvery, No. 1	..... @	12.50
Southern Silvery, No. 2	..... @	11.75
Southern Coke, No. 2	11.25 @	11.50
Southern Coke, No. 3	10.75 @	11.00
Southern, No. 1, Soft	11.25 @	11.50
Southern, No. 2, Soft	10.75 @	11.00
Tennessee Charcoal, No. 1	15.50 @	16.00
Tennessee Charcoal, No. 2	15 00 @	15.25
Alabama Car Wheel	18.50 @	18.65
Jackson County Silvery	15.00 @	16.00
Other Ohio Silvery	13 00 @	13.50
Coke Bessemer	12.00 @	.....

The past week has been quite an active one in the Pittsburgh district, and some heavy transactions in Bessemer Pig have taken place, the purchases being mainly by Steel makers whose output of Pig Iron does not equal their converting capacity. There is very little doing in Foundry Iron, and prices are without material change. Quotations are given as follows:

No. 1 Foundry	$11.50 @	$11.75, cash.
No. 2 Foundry	10.50 @	10.75 "

Southern markets have been quiet and barely steady during the week, there being no large sales effected, although toward the close there was more inquiry for the lower grades of Southern Iron, which it is hoped may result in more business in the future. Northern consumers of Iron want Southern Iron to improve their mixture, but are deterred from buying by the high freight rates, and there is a movement on foot to have them modified this season, but whether it will be successful time alone can determine. Prices are well sustained on the small business passing, and nearly all kinds of Iron are being taken. Some of the Southern furnaces are meeting the moderate demand quite freely, while others are not free sellers at present prices, but there is nothing to warrant any essential change in quotations. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$11.00 @	$11.25
Southern Coke, No. 2	10.00 @	10.25
Southern Coke, No. 3	9.50 @	9.75
Ohio Soft Stone Coal, No. 1	14.50 @	15.50
Ohio Soft Stone Coal, No. 2	14.25 @	14.50
Lake Superior Coke, No. 1	13.00 @	13.50
Lake Superior Coke, No. 2	12.00 @	12.25
Hanging Rock Charcoal, No. 1	17.00 @	17.50
Hanging Rock Charcoal, No. 2	16.50 @	17.00
Tennessee Charcoal, No. 1	13.50 @	14.00
Tennessee Charcoal, No. 2	12.50 @	13.00
Standard Southern Car Wheel	16.75 @	17.00
Lake Superior Car Wheel and Malleable	16.50 @	17.00

Metal Market.

Pig Tin.—Very little change in prices has taken place here despite the somewhat wide fluctuation in London quotations, and speculation has continued very tame. Purchases by interior dealers and consumers have been of somewhat larger volume, however, and made quite an impression upon stocks in first hands. At this writing the tone of the market seems to be quite steady, with 19¢ @ 19.10¢ quoted for 5-ton lots, net cash terms, and the usual premium for ordinary jobbing quantities. On distant future deliveries 19.10¢ was bid.

Copper.—More business has been done in Lake Superior Ingot, chiefly on home account, but prices have suffered slightly, some brands going at 9½¢. The Calumet & Hecla sold at that price quite freely. Business in Electrolytic has increased considerably, several million pounds having been placed, for delivery during the next six months. The prices are not divulged but the market is now quoted stronger at 9⅝¢ @ 9¾¢. Casting stock has met with better sale also and prices are steady, with 9⅛¢ @ 9¼¢ quoted for most brands. Jobbing business has been more active, and prices firm at 11¢ for small lots of Ingot from store.

Sheet Copper.—The demand from consumers shows rather more activity, and inquiries are reported as more frequent. Still, business is far below the average for the season, and the stagnation in building promises no material improvement in the near future. Cornice makers are doing little, and other consumers of manufactured Copper are buying on the most restricted scale. Prices are fairly firm, in conformity with the list.

Pig Lead.—Sales of Common Western in this market during the past week aggregate 1200 tons or more. With the increase in business there has been a further advance in prices. The dealings were at from 3.37½¢ to 3.45¢ for

round lots, up to 3.47½¢ for single carloads. At this writing there is little, if anything, on sale at less than 3.50¢. There were bids of 3.45¢ for May delivery on speculative account, chiefly by operators who went "short" of the market when it was considerably lower than it is at the present time. The demand from small consumers does not increase to any appreciable extent. Jobbers' prices are firm at 3⅝¢ @ 4¢ for small parcels and tending to the higher figure. Sheet Lead and Lead Pipe are dull.

Spelter.—The demand is exceedingly slow at present and below the average for the season. Contrary to expectations, prices have softened somewhat instead of inclining to betterment, and have ruled relatively lower than in the Western market. Ordinary brands were freely offered in round lots at 3.85¢ without stimulating purchases, and a shading to 3.80¢ brought about sales of a few carloads only. For small retail lots 4¼¢ @ 4½¢ is quoted, with but a narrow business doing.

Antimony.—The market is steady at 8¾¢ @ 9¢ for Hallett's and 10⅛¢ @ 10¼¢ for Cookson's, with the usual premium on small lots, and a moderate business passing.

Nickel.—Moderate sales have been made at 40¢, and that price is evidently full high for other than small quantities.

Tin Plate.—Disappointment over the character and volume of business is expressed by sellers, and it would appear that the market has lost rather than gained tone during the past week. Spot purchases, which are conducted on the most conservative lines, have been almost wholly of a retail character, and in some instances at prices below those generally quoted. Orders for future delivery have been placed with a degree of reserve that is remarkable, considering the low prices named. Domestic Ternes are about the only really active stock at present, the advent of mild springlike weather having created a demand for Roofing Plates for repairs and other work. The dullness generally reigning is attributed to uncertainties connected with the pending tariff legislation. Stocks are badly broken up all round, and shipments from the other side are decreasing in volume monthly. Prices are nominally firm, but really they are liable to substantial shading on desirable orders.

In reviewing the situation as regards Coke Tins, Charles S. Trench & Co., Tin Plate brokers, of this city, write under date of March 21 as follows: "The action of the Senate committee reporting Tin Plates at the rate at which the tariff bill passed the House, 1⅛¢ ℔ lb, but changing date of its going into effect from October 1 to June 30, had the effect of completely paralyzing business with the packers and can makers, but as the result of the protests that have been made from the canning industry, the Senate committee have today finally reported their tariff bill at 1¢ ℔ lb on Tin Plates, to take effect October 1, same date as Wilson bill passed the House, and this will settle the question of date, and enable can makers and packers to go ahead with their season's arrangements. It is now almost a certainty that whatever may be the fate of the tariff bill it will not affect the season's pack, and the cans for the season of 1894 will be made from Tin Plates paying the present McKinley duty. We see nothing now to be gained by delaying purchases for this season, as the nearer we get to final action on the tariff the firmer the market abroad will be, and already for the past two weeks there has been a firmer market there. It is impossible to buy July, August and September deliveries at the prices ruling for April and May from the English makers—as present prices show them in nearly every case a loss—and they expect a rush for goods the moment the Americans make up their minds about when the tariff bill will be finally passed."

A special cable dispatch from London to *The Iron Age* of March 21 reports the British Tin Plate market, both as regards home and export business, to show no improvement. Prices are still rather weak, but show no positive change. Liverpool quotations are quoted as follows.

IC Charcoal, Alloway grade	12/ @ 12/6
IC Bessemer Steel, Coke finish	@ 10/6
IC Siemens " " "	11/ @ ....
IC Coke, B. V. grade, 14 x 20	Nominal.
Charcoal Terne, Dean grade	10/ @ 10/6

Sheet Iron.—Black Iron shows less movement than last week. Prices for this material are thoroughly demoralized by keen competition and entirely in buyers' favor. Galvanized Sheets, on the other hand, are firmer in the East. Some of the larger manufacturers are reported to have withdrawn their quotations on Galvanized Iron, either from the expectation of an advance in prices or because they have contracted ahead for their product as far as they care to do at the present rates. Mills are referred to as busy and stocks not excessive.

The official statement of the Treasury receipts from internal revenue for the first seven months of the current fiscal year shows a decrease of over $12,260,000 as compared with the corresponding period of last year. The falling off was almost wholly confined to the revenue receipts on tobacco, spirits and fermented liquors. January's aggregate receipts were nearly $1,000,000 less than those for January, 1893.

The number of failures announced in the United Kingdom during the year 1893 was 10,658, of which 1045 were in the financial, wholesale, and manufacturing branches of trade, and 9031 in retail trade, professional pursuits, building, among the working classes, &c.

Chicago Report.

Scrap.—Very little Old Material is moving. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—The demand is light. Arkansas Anthracite is reported to be a new factor in the Western market, which bids fair to cut an important figure in localities west of the Missouri River, extending up into Kansas. Carload lots of 12 net tons or over are nominally quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

The improvement bill designed to give the Cramps room for the necessary enlargement of their shipbuilding establishment appears to be meeting with vexatious delay in its progress through the City Council of Philadelphia. The Cramps are naturally much hampered in their work by the tardiness of the city fathers in the matter, as they have long been ready to begin the extensions and improvements which are rendered absolutely necessary by the growth of their business.

The business situation in Pittsburgh appears to be better than it has of late been credited to be. The *Commercial Gazette* of that city, in an article on the trade outlook, asserts that about three-fourths of the regular forces are again at work at the iron and steel mills and factories. Among the unemployed, says that journal, 5000 are city contract laborers who are always idle during the winter, but who will be again employed by the middle of April.

CONDITION OF THE

Hardware Trade.

THERE is something of an improvement in the volume of business and a quickening in the general demand. The improvement is shown in the increase in the number of orders received by jobbing houses and manufacturers. The disposition to purchase in moderate quantities is marked and finds an illustration in the experience of a prominent File company, whose orders for the past few weeks considerably exceeded in number those of a corresponding time a year ago, though the aggregate amount of goods covered by them showed something of a falling off. The trade are purchasing seasonable specialties quite freely, this department of business being stimulated by the moderate weather which has recently prevailed. There are also indications of an improvement in the demand for Builders' Hardware, a line which has for some time been exceptionally quiet. There are few changes in price to note, but the tone of the market is weak and in many lines there is a tendency toward somewhat lower prices. This is especially the case in goods where there is considerable competition, the price of specialties which are made by only one manufacturer being more generally well maintained. In addition to the usual telegraphic advices from Chicago and St. Louis, we give below the letter from our Philadelphia correspondent which was omitted last week.

Advices from Chicago.—The Shelf Hardware jobbers report a heavy increase in the demand for general Hardware, caused by the fine spring weather. Seasonable goods are moving freely. Builders' Hardware is not so active, but a great deal of building is going on, so that a much better trade in this line is certain later in the season. Staple goods are picking up again. Barb Wire is in especially good demand. The heavy Hardware trade also shows great improvement, although even yet the volume of business is much under the normal. The orders now coming in from consumers call for an unusual variety of sizes, showing that stocks have been completely used up. Collections are getting to be considerably better than they have been.

Notes on Prices.

Wire Nails.—The excellent demand for Wire Nails which has prevailed for the past few weeks still continues, and the manufacturers are receiving many orders from the larger and the smaller trade. As a result, they are fully occupied, and in some cases are unable readily to supply the wants of their customers as promptly as desired. The market continues steady in the matter of price on the basis of $1.10 for carload lots at mill, but it is understood that this figure can still be slightly shaded on especially large and attractive orders. The manufacturers, however, appear to be maintaining prices quite firmly, notwithstanding the fact that rumors are current of a weakness in the market, which we have been unable to verify. Small lots from store in New York are held at $1.25 to $1.30.

Advices from Chicago.— Although rumors are in circulation of weakness in Wire Nails, there is very little evidence in sight here. The reduction in freights appears to have had more effect in lowering prices than an attempt to secure business by the manufacturers. The factories all seem to be full of orders, and they have been known to refuse positive offers at concessions from prices hitherto current. One large establishment was compelled during the week to put its machines on double turn in order to make prompt shipments to consumers, who have begun to clamor for deliveries on their contracts. Jobbers report a considerably better movement from stock. Under these circumstances it would appear singular if prices should weaken. Ordinary factory lots continue to be quoted at $1.15, Chicago, while small lots from stock are selling at $1.20 to $1.25.

Cut Nails.—The demand for Cut Nails is fair, though not specially heavy, but manufacturers report an increased inquiry and the promise of a good business in the near future. The Eastern manufacturers are maintaining prices pretty steadily and adhering to their policy of quoting prices for Nails delivered at the principal points in their territory. The following are their quotations for carload lots delivered at the points named: New York, Albany, Boston and Savannah, $1.05; Buffalo, $1.02, and Harrisburg and Philadelphia, $1. Concessions are made from the above prices in some instances on attractive orders or where the manufacturers come into competition with Western makers. The price from store in New York is $1.15.

Advices from Chicago. —Manufacturers report about the same condition of affairs as stated during the past three or four weeks. The demand is considered quite good under the general trade conditions and the distribution of Cut Nails is still spreading over a wider area. Prices are as before on the basis of $1.05, Chicago, factory for lots on 60-cent average. Small lots from stock are selling at $1.15.

Barb Wire.—A very satisfactory condition is reported in the Barb Wire market, both in the matter of price and demand. The volume of business is large and the mills are full of orders, so much so that in some cases they are unable to make shipments with sufficient promptness to meet their customers' requirements. Prices are steadily maintained on the following basis: Carload lots of Galvanized Four-Point, Pittsburgh, $2.15; Cleveland, $2 20; Cincinnati or Allentown, $2.25 ; Chicago or New York, $2.35, with an advance of 5 cents per 100 pounds in less than carload lots.

Advices from Chicago.— Manufacturers report a great deal more inquiry for Barb Wire, as well as plain Wire. They are exceedingly gratified at the manner in which orders are coming in and report stiffer prices. If the movement continues, as from present appearances it will, the largest manufacturers will in a short time be completely overwhelmed with business. Quotations are $2.35 to $2.40 for small lots of Barb Wire from stock, and $2.25 to $2.30 for carloads.

Wrought Iron Pipe.—The volume of business in Wrought Iron Pipe is reported fair, but competition between the manufacturers is active, and as a result prices have settled to a comparatively low level, concessions being freely made on large orders.

Rope.—The demand for Cordage generally is light and prices are irregular and somewhat weak. Quotations are on a basis of 6½ cents for Manila, 5 cents for Sisal and 5 cents for New Zealand, slight concessions being sometimes made, but only on especially large lots.

Pocket Oilers.—The Ægis Pocket Oilers manufactured by the Scovill Mfg. Company, Waterbury, Conn., are sold, either style, at $8 per gross, net.

Watch Carrier.—Burleigh's Bicycle Watch Carriers, manufactured by Geo. K. Burleigh, Tilton, N. H., are sold at 75 cents each, or with a 2-inch clock at $2 each, from which prices a discount of 33⅓ per cent. is allowed.

Relief Wringers.—Relief Wringers, manufactured by the American Wringer Company, 99 Chambers street, New York, are sold at the following prices, which are subject to a discount of 2 per cent. for cash in ten days :

Without Cog Wheels.

No.	Size of Rolls.	Per dozen.
2....	10 x 1¾.....	$20.00
3....	11 x 1¾.....	24.00
4....	12 x 1¾.....	28.00
5....	14 x 1⅞.....	37.00
6....	16 x 2.....	46.00

With Cog Wheels.

No.	Size of Rolls.	Per dozen.
22....	10 x 1¾.....	$22.00
33....	11 x 1¾.....	26.00
44....	12 x 1¾.....	30.00
55....	14 x 1⅞.....	39.00
66....	16 x 2.....	48.00

Glass.—While there is little if any improvement noticed in the demand for Window Glass, there is a reported tendency toward firmer prices by manufacturers than for some time past. It is understood that 88 per cent. discount for single, and 90 per cent. discount for double strength Glass, prices that have been offered by Western manufacturers and jobbers, are not now obtainable. Pittsburgh quotations remain the same as last week—85 and 10 and 5 per cent. discount for single, and 85 and 20

per cent. discount for double strength Glass. Plate Glass is still sold at very low prices owing to the sharp competition between manufacturers.

Old Metals. — Business continues quiet. The demand does not increase, and prices keep at a very low level. The following quotations represent about the prices paid by New York dealers :

Heavy Copper	℔	lb	7¢
Light and Tinned Copper	℔	lb	6¢
Heavy Brass	℔	lb	5¢
Light Brass	℔	lb	4¢
Lead	℔	lb	3¢
Tea Lead	℔	lb	2½¢
Zinc	℔	lb	2¼¢
No. 1 Pewter	℔	lb	13¢
No. 2 Pewter	℔	lb	6¢
Wrought Scrap Iron, ℔ gross ton	$7.00	@	$8.00
Heavy Cast Scrap, ℔ gross ton	7.00	@	8.00
Stove Plate Scrap, ℔ gross ton	4.00	@	5.00
Burnt Iron, ℔ gross ton	3.50	@	4.00

Old Rags, Paper, &c.—A little more movement is noted in paper stock, but business is still below the average. Prices are practically unchanged, the following representing those now ruling :

No. 1 White Rags	℔	lb	3¼	@	3⅛¢
No. 2 White Rags	℔	lb	2¼	@	2⅛¢
Mixed Rags	℔	lb			⅝¢
Blues and 3ds	℔	lb	1	@	1¼¢
Hard Sized White Shavings	℔	lb	2¼	@	2⅛¢
No. 1 White Book Shavings	℔	lb	2	@	2⅛¢
No. 2 White Book Shavings	℔	lb	1	@	1⅛¢
Light Book Shavings	℔	lb			⅝¢
No. 1 Mixed Shavings	℔	lb	¾	@	1 ¢
No. 2 Mixed Shavings	℔	lb	½	@	⅝¢
No. 1 Printed Books	℔	lb	1	@	1¼¢
Ordinary Mixed Books	℔	lb	½	@	⅝¢
Newspapers	℔	lb	2-5	@	½¢
No. 1 Manila Paper	℔	lb	1	@	1⅛¢
No. 2 Manila Paper	℔	lb	⅞	@	⅝¢
Bogus Paper	℔	lb			½¢
Common Paper	℔	lb			⅜¢
Straw Chips	℔	lb			½¢
Binders' Clippings	℔	lb	½	@	⅝¢
Jute Butts	℔	lb	1⅞	@	2 ¢
No. 1 Jute Bagging	℔	lb	1	@	1¼¢
Mixed Bagging	℔	lb	¾	@	1 ¢
No. 2 Bagging	℔	lb	½	@	⅝¢
Hemp Twine	℔	lb	2	@	2¼¢
Manila Rope	℔	lb	2¼	@	2⅜¢
Jute Rope	℔	lb	1½	@	1¾¢
Mixed Rope	℔	lb	¾	@	⅞¢

Old Rubber.—There is very little doing in Old Rubber, and prices remain at the low level they have held for some time past. The following quotations represent about the rates paid in New York :

Car Springs, ton lots, ℔ lb.	@	$0.03¼	
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.03	
Rubber shoes, less than carloads, ℔ lb.	0.02¼	@	.03⅛
Large Hose, ℔ ton	@	9.00	
White Wringer Rolls, ℔ lb.	@	.04¼	
White Syringes, ℔ lb	@	.05	

Trade Notes.

The big five-story tinware factory of S. A. Ilsley & Co., York and Adams street, Brooklyn, N. Y., was destroyed by fire on March 18. The loss was a total one, estimated at about $300,000, but fully covered by insurance. Some 350 hands are thrown out of work. Messrs. Ilsley & Co. are manufacturers of Decorated Tinware.

The Water Gas Heater Company were incorporated recently at Baltimore, Md., by Samuel Childs, J. Henry C. Watts, E. Parkin Keech, Jr., Wm. F. Beasley and John T. Mason, R., with a capital stock of $100,000. The company will manufacture cooking and heating apparatus.

The Day, Ward Company, composed of Geo. E. Day, A. G. Ward and W. C. Winfield, at Warren, Ohio, will, it is reported, manufacture Steel Cased Bathtubs, Blacksmiths' Blowers and other articles for which patents have been obtained.

The New Philadelphia Sheet Mills New Philadelphia, Ohio, were closed down for a few days last week as a mark of respect to E. C. Smith. This week the whole plant, consisting of five sheet mills and sheet bar mill, is in operation. The galvanizing department of this company is now in operation.

The sheet mills and galvanizing shop of the Cambridge Iron & Steel Company, Cambridge, Ohio, are running at their usual gait. It is a fact worthy of note that a stoppage in these mills is a very rare occurrence.

Curtis & Curtis, Bridgeport, Conn., advise us that they are very busy filling large orders for Forbes pipe machines received by cable from England.

The Peck, Stow & Wilcox Company, Southington, Conn., have under consideration plans for the construction of a new malleable iron foundry and a new gray iron foundry. In former years the company manufactured their own iron and have decided to renew operations in this line.

The Manufacturers' Association of Kings and Queens Counties held another meeting Tuesday evening, March 20, at the Union League Club, Brooklyn, for the purpose of effecting a permanent organization. The following officers were elected : H. B. Haigh, president ; William H. Nichols, first vice-president ; Ernest C. Webb, second vice-president. In addition to the six directors elected March 6, for the purpose of incorporating the body, the following gentlemen were chosen to complete the board : D. R. Morse, Thos. C. Smith, John H. Hanan, Robert Dunlap, John H. Schuman, F. W. Wurster, D M. Somers, E. W. Bliss, J. Adolph Mollenhauer, A. G. Jennings, F. J. Logan, Cord Meyer, Jr., William Vogel, C. N. Chadwick. The balance of the board consists of H. B. Haigh, Lowell M. Palmer, William H. Nichols, E. Dwight Church, Walter L. Pierce and Ernest C. Webb.

The Government is finding some difficulty in securing the necessary land on which to build the proposed naval dry dock at Algiers, near New Orleans, La. The landholders owning the desired property are asking such extortionate prices for it that expropriation will probably be resorted to by the Government.

The largest vessel on the lakes was successfully launched at the Wyandotte yards of the Detroit Dry Docks Shipbuilding Company, Detroit, last week. She is 362 feet over all, 42 feet beam and 25 feet in depth. The vessel has been built for a syndicate, and is designed to carry 4000 net tons of cargo.

Bids have been called for by the Lighthouse Board for the maintenance of buoys along the New Jersey coast, the contract to be for one year from July 1 next. Bids must be in by April 1.

Andrew Carnegie's offer to duplicate every dollar contributed for the relief of the poor in Pittsburgh, before March 1, cost him something over $125,000.

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Metal and Miscellaneous Prices.

CHICAGO, MARCH 22, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

Per box.

Oalland and MelynGrade { IC, 10 x 14.....@ $6.75; IC, 12 x 12.....@ 6.75; IC, 14 x 20.....@ 6.75; IC, 20 x 28.....@ 13.50; IX, 10 x 14.....@ 8.75; IX, 12 x 12.....@ 8.75; IX, 14 x 20.....@ 8.75; IX, 20 x 28.....@ 17.50; DC, 12½ x 17..... @ 6.50; DX, 12½ x 17.....@ 8.50

Allaway Grade, { IC, 10 x 14.....@ 6.35; IC, 12 x 12.....@ 6.35; IC, 14 x 20.....@ 6.35; IC, 20 x 28.....@ 12.70; IX, 14 x 20.....@ 7.85; IX, 20 x 28.....@ 15.20

Coke Plates—Bright.

Per box.

Steel Coke—IC, 10x14.14x20.$5.65 @$5.75; IC, 14x20.90 ℔..... @ 5.25; IC, 14x20, 100℔..5.50 @ 5.65; 10 x 20..... @ 8.50; 20 x 28...11.30 @11.50; IX, 10x14, 14x20 .....@ 7.25

B.V. Grade. IC,10x14, 14x20.5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—
IC. 14 x 20 ...@ $5.62½; 20 x 28.....@ 11.25; IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—
IC, 14 x 20.. 6.12½@ .....; IC, 20 x 28..12.25 @ .....; IX, 14 x 20.. 7.62½@ .....; 20 x 28..15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25

Royal, extra, IC, 14 x 20..... 7.25

Merion, IC, 14 x 20..... 7.00

Almond, IC, 14 x 20..... 6.50

Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch, IC, 20 x 28.....@$11.50
Crescent, IC, 20 x 28.....@ 12.25
Crescent, IX, 20 x 28.....@ 15.25
Empire, IC, 20 x 28.....@12.50
Empire, IX, 20 x 28.....@15.50
Hickory, IC, 20 x 28.....@ 12.75
" IX, 20 x 28.....@ 15.75
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 15.00
" IX, 20 x 28.....@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28.....@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28.....@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28..... .@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28.....$23.60
Westmoreland:
IC, 14 x 20..... $6.25
IC, 20 x 28..... 12.50
Elwood:
IC, 20 x 28 ..... $12.00
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50
Illinois, Old Method:
IC, 20 x 28.....$17.00
E. L.:
IC, 20 x 28.....$12.50
Jessie:
IC, 20 x 28.....$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20.....$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 .....11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28.....19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28.....22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28.....12.50
" " IX, 20 x 28.....15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared).....$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared).....19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared).....16.50
Columbia, IC, 14 x 20 (Stamped).... 7.25
" IC, 20 x 28 (Stamped)....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28.....13.00
Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28.....12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 .....12.00
Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28..... 12.00
" IX, 20 x 28.....15.00
" (Redipped), IC, 20 x 28.....17.00
Old Process:
IC, 14 x 20..... 9.25
IX, 14 x 20.....11.25
IC, 20 x 28.....18.50
IX, 20 x 28.....22.50
H. B. L., Old Style:
IC, 14 x 20..... 7.75
IX, 14 x 20..... 9 25
IC, 20 x 28.....15.50
IX, 20 x 28.....18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 4-10¢	3 ¢
17 to 20	℔ 2 5-10¢	3 1-10¢
21 to 24	℔ 2 6-10¢	3 2-10¢
25 and 26	℔ 2 7-10¢	3 3-10¢
27	℔ 2 8-10¢	3 4-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢; dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality..... ....dis.75%

Copper—

Ingot.

Lake.....11¢ @ 11½¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount, 30%.

Copper Bottoms.

Discount, 30%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...85¢
Plain, above 3 inch.....45¢
Plain, 5-16 inch .....45¢
Plain, ¼ inch.....60¢
Plain, 3-16 inch.....$1.00
Plain, ⅛ inch.....$1.50
Fancy Tubing, Brass, to No. 20 incl.....43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass.....

40 @ 45 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....4¾¢
300 ℔ casks.....5 ¢
Loose sheets..... 5¼¢

Lead—

Soft Pig Lead.....3¾¢
Bar .....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12¾¢@13¼¢
Extra Wiping.....11¾¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12½¢
Hallett's.....11¼¢@11⅝¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain.....60%
1¼ and under, Galv.....52½%
1½ and over, Plain..... .. ...70%
1½ and over, Galv.....60%
Boiler Tubes, list Oct. 24, 1892.....70%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....66%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.50 square
Climax.....$3.35 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.50 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ ℔, 2 ¢
" " Brown.....℔ ℔, 1½¢
" " Purple.....℔ ℔, 2½¢
" Ground in oil, B. Red ℔ ℔, 6½¢
" Ground in oil, Red..℔ ℔, 6½¢
" Ground in oil, Brown ℔ ℔, 5½¢
" Ground in oil, Purple ℔ ℔, 6 ¢
Linseed Oil, Boiled, in oals.....53¢
Linseed Oil, Raw, in bbls.....51¢
Mineral Paints.....2@4¢
Orange Mineral.....9¾¢
Pure White Lead in Oil.....6@6½¢
Dry White Lead in bbls.....5½@5¾¢
Red Lead, American.....6@6½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ℔ gal..... .84¢
Spirits Turpentine, in bbls., ℔ gal..36½¢
Asphaltum, Trinidad Refined, ℔ ton...$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, MARCH 23, 1894

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:
Small lots.....℔ ℔, 75¢
100-℔ lots.....℔ ℔, 73¢
Ton lots.....℔ ℔, 70¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....℔ ℔, 70¢
100-℔ lots.....℔ ℔, 65¢
Ton lots.....℔ ℔, 60¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....℔ ℔, 65¢
100-℔ lots.....℔ ℔, 60¢
Ton lots.....℔ ℔, 55¢

Antimony—

Cookson.....℔ ℔, 10¾¢
Hallett's.....℔ ℔, 10½¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu...	43

25@30%

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ ℔
Over 3½ to 5 inches inclusive.....18¢ ℔ ℔

-iston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ ℔
Over 3½ to 5 inches inclusive.....19¢ ℔ ℔

Clips—

Suffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....80%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Mitres; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10¼¢
Ansonia Grade Casting.....9¾¢
Planished. .....net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips, Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz...20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2.60	2.90¢
Nos. 17 to 21	℔ ℔, 2.70	3.00¢
Nos. 22 to 24	℔ ℔, 2.80	3.10¢
Nos. 25 and 26	℔ ℔, 2.90	3.20¢
No. 27	℔ ℔, 3.00	3.30¢
No. 28	℔ ℔, 3.05	3.40¢

American B. B.....℔ ℔, 4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11¾@12½¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 6%
Craig Polished Sheet Steel .... ℔ ℔, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	6¾@6¾%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Filter Joints—

Lee's..... .....33⅓%

Lead—

American Pig.....3¾¢@4¢
Bar.....4¼¢
Pipe.....6¾¢, 20%
Tin Lined Pipe.....16¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6¾¢, 20%
Old Lead in exchange, 2¾¢ ℔ ℔.

Metal Exoanded—

Manufacturers' list No. 5.

Lathing 10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6¾ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1¼
Red Venetian, American	1¼ @ 2¾

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01½ @ .01¾
In tin cans..... .01½ @ .02¼
In bladders..... .01¾ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 0 Inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot
Slag Wool, ordinary	1¼¢	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¾	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained.
Rosin, C. & D..... ₩ bbl. $1.10@$1.20
Rosin, E. & F..... ₩ bbl. $1.30@$1.45
Rosin, G. & H..... ₩ bbl. $1.65@$1.90
Rosin, I. & K..... ₩ bbl. $2.25@$2.60
Rosin, M. & N..... ₩ bbl $2.80@$3.00

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Cbapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50

Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

& ½..... 13½@14¢
No. 1..... 11¾@12½¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.

f.o.b. New York.

In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.

No charge for package.

Bbls., about 500 ℔, ₩ ℔..... 3½¢
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
75¢ extra for keg. 5% dis.
Kegs, about 55 ℔, ₩ ℔..... 4¢

Yager's Soldering Salts.

¼-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4¼¢@4½¢
Bertha (pure)..... 8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 21½¢
Straits, pigs, ₩ ℔..... 21¢
Straits in bars, ₩ ℔..... 22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20 ... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 5.50
" IX, 14 x 20..... 6.50
Atlantic, IC, 14 x 20..... 5.75
Bonus, Extra Coated, IC, 14 x 20... 6.75
" IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.50
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
Dane, IC, 14 x 20..... 5.50
DeMill's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 .....12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.25
Fort Pitt, IC, 20 x 28 ..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... .....12.00
" IX, 20 x 28..... .....15.00
Newcastle Real Old Method, IC, 14x20 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20..... 5.25
Palacio, IC, 14 x 20..... 5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 8.00
Phœnix, IC, 14 x 20..... 5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resqnared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20..... 5.75
Tip Top, IC (Reaquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20..... 5.37½
Vigilant, IC, 14 x 20..... 5.50
Waldo Redipped, IC, 14 x 20..... 6.75
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.50
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Iowa, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merlon, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" " IX, 14 x 20.. .. 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" " IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20 ..... 7.25
Versailles, IC, 14 x 20 ....5.75
Yougbiogheny, IC, 14 x 20..... .....6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20.....$7.50
20 x 28..... 15.00
IX, 14 x 20 .... 8.75
20 x 28 ..... 17 50
Pontymister Grade, IC, 14 x 20..... 6 50
20 x 28.....13.00
IX, 14 x 20. .. 7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20..... 5.75
20 x 28..... 11.50
IX, 14 x 20..... 6 75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20..... .. $5.37½
20 x 28.....10.70
IX, 14 x 20..... 6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20..... 5.25
20 x 28.....10 50
IX, 14 x 20..... 6.40
20 x 28.....12.80

Imported Bright Plates

Charcoal.

Duty: 2.2¢ ₩ ℔.

Melyn and Calland Grade.	IC, 10 x 14	$6.37½
" "	IC, 12 x 12	6.62½
" "	IC, 14 x 20	6.37½
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.87½
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
"	DC, 12½ x 17	5.50
" "	DX, 12½ x 17	6.50

Coke.

Steel Coke.—IC, 10x14, 14x20 $5.25@$5.35
10x20..... 8.12½
20x28.....11.00
IX, 10x14, 14x20..... 6.60
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plates

IXX, 14x26..(112 sheets)..... $13.35
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 4¾¢
Per ℔..... 5¼¢

It Is Reported—

That T. T. Flynn and Angelo Walker have bought the stock of Hardware of Frank Hall of Prattsburg, N. Y., and will continne the business. Mr. Flynn was formerly a member of the firm of G. W. Peck & Co., and Mr. Walker a clerk in the same establishment.

That Charles H. Clark, Hardware merchant, of Kennebunkport, Maine, is closing out his stock.

That the Miller Hardware Company, Bay City, Mich., have been incorporated, with a capital of $100,000.

That the Hardware store of P. Guilloz, 148 Grand River avenue, Detroit, Mich., was entered by burglars on the 28th ult. and robbed of $40 worth of Cutlery.

That the Hardware store of A. Morehouse, Fenton, Mich., was burglarized on the 4th inst.; $50 to $60 worth of Hardware was carried off by the thieves.

That the firm of Darby & Reed, Hardware dealers, North Adams, Mass., have been dissolved by the retirement of Mr. Reed. J. M. Darby has purchased his partner's interest in the concern.

That the Stoddard Hardware Company have been incorporated at Minneapolis, Minn. The capital stock is $50,000. The incorporators are F. L. Stoddard, G. P. Derickson and W. B. Miller.

That the store and Hardware business of the late James Nutter, at St. Peter, Minn., have been purchased by his sons, William, Emmett and Geo. F. Nutter, and hereafter the firm will be known under the style of Nutter Bros.

That the Hardware store of Robie & Peasley, Greeley, Col., was entered by burglars on the 1st inst., and $100 worth of Knives and Revolvers stolen.

That A. P. Hogle's Hardware store, at New Palestine, Ind., was damaged by fire on the 28th ult.

That T. Perkins' Hardware store, Manchester, Vt., was destroyed by fire on the 2d inst.

That the Hardware store of Haley & Chesebro, Stonington, Conn., was broken into by thieves on the 28th ult. and $150 worth of Cutlery, &c., taken.

That J. A. Collet's Hardware store, at Morgantown, Ind., was destroyed by fire on the 3d inst.

That the Hardware firm of Anderson & Farton, Stoughton, Wis., has been dissolved by mutnal consent, Mr. Farton retiring. Mr. Anderson will continue the business.

That S. O. Stillman has retired from the Hardware business, at Galena, Ill., after 40 years' connection with it. His successors are W. W. Stillman, his son, and Wm. H. Stahl. The firm style will be Stillman & Stahl.

That Mr. Hemphill of Forreston, Ill., has opened a Hardware store at Polo.

That Newark & Drury, Cadillac, Mich., will put in a stock of Hardware at McBain.

That Edgar John of Maxwell, Iowa, has purchased the interest of Webster Bishop in the Hardware firm of Willard, John & Co., Cambridge, Iowa.

That Shidler & Shidler, Canton, Ill., have sold their stock of Hardware to Mitchell & Moore and have removed to South Bend, Ind., where they will probably re-enter the Hareware business.

That Mr. Holcomb of Holcomb & Evans, Creston, Iowa, has sold his interest in the firm to I. N. Fields, who, with George Evans, will hereafter conduct the business under the firm name of Evans & Fields.

That the Byers Hardware Company lost over $18,000 by a large fire at Kaslo, B. C., on the 25th ult.

That George Henderson has purchased the interest held by the late A. J. Chrysler in the Hardware firm of Chrysler & Caskey, Ellis, Kan.

That R. G. Dalton has sold his interest in the Hardware business at La Junta, Col., to his partner, A. H. Cawthron.

That Dickson & Taylor have opened a new Hardware store at Armour, S. D.

That J. N. Duily's Hardware store, at Cleghorn, Iowa, was burglarized on the 3d inst. Fifty dollars' worth of Revolvers and Razors were stolen.

That the McQuesten & Sawyer Company, Muscatine, Iowa, have been incorporated. The authorized capital is $50,000. The Board of Directors of the company comprises W. W. McQuesten, S. P. Sawyer and S. F. Sawyer.

That Wolverton & Byrd's Hardware store, at Spokane, Wash., was badly damaged by fire on the 3d inst.

That George Pearce has sold his Hardware stock, at Fisher, Ill., to F. B. Vennum.

That the Tompkins Hardware Company, Cripple Creek, Col., have established a branch store at Victor.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 31, 1894.

DAVID WILLIAMS, - PUBLISHER

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Locating a Heating Boiler.

After computing the amount of radiating surface necessary to heat a building and locating this in advantageous positions, the size of boiler necessary to supply the heat to the radiators and boiler location next demand attention. Now, as the location of the boiler may greatly affect the size of mains required to carry steam to the various parts of the building to be heated, and as the size of the mains is a notable element in the cost of erection as well as the performance of steam or hot water heating work, more careful attention to judiciously locating a heating boiler with relation to the distribution of the radiators would result in pecuniary gain to a large number of beginners in these kinds of heating work. The remark applies more particularly to those whose experience is limited, because those who have been long in the business have generally learned the lesson. An inspection of steam and hot water heating plants, particularly in country places, where such plants have been erected mostly by local fitters of limited practice in this class of work, will show many examples of a lack of due consideration of the effect upon cost of the selection of a judicious site for the boiler. A well remembered instance is that of a country church wherein the contractor for steam heating apparatus might have saved easily $75 to $100 by a better chosen boiler position.

A Reason Why Mistakes Are Made.

One potent reason why such mistakes are made by inexperienced fitters is that they give too much heed to the counsel, in this regard, of the salesmen from whom they purchase their boilers. In the absence of definite knowledge of the peculiarities of any particular job, the only rule that can be given safely is to set a boiler as near as convenient to the smoke flue with which it is to be connected. And this is the rule which salesmen generally lay down to their customers. It is true that the draft of a boiler furnace is more certain to be good in this position than where a long smoke pipe connection is required. But in a properly constructed boiler, having a total flue area ample to dispose of the gases of combustion, proximity to the chimney is not a factor of such prime importance in boiler setting as it is sometimes regarded. Instances of work done by firms of high reputation and which have been highly successful in operation where the boilers have been set anywhere from 20 to 50 feet from the chimney might be easily cited. It must be confessed that many boilers designed for domestic heating would act sluggishly under such conditions; but there is no law compelling a contractor to use such a boiler, and in cases where placing a boiler close to a chimney entails an extra expense for piping he should seek a manufacturer who is willing to guarantee satisfactory draft in boilers of his make in positions within reasonable distance from chimney flues.

Goods Used in Mexico.

The following interesting letter is received from Philip G. Roeder, 664 Cedar avenue, Cleveland, Ohio, who has spent a dozen years traveling as a manufacturers' agent in Mexico:

In reply to your inquiry as to the demand in Mexico for American goods in the lines of the patrons of your valuable journal, I will state that I have spent several years in our sister republic, animated by patriotism and the greed of gain, introducing American wares. The very poor in Mexico use few or no utensils of iron. Small earthenware (charcoal) ovens or "brazeros" take the place of our stove, and pots, jars and plates of the same material serve to cook their beans and stew their meats. A piece of sheet iron placed over the brazero is all they need to fry their tortillas (corn pancakes) or their "enchilados." In the cities, however, modern improvements are much in vogue. The hotels and large restaurants are using ranges to some extent, and the oil and gasoline stove finds ready sale, especially during the winter months. Houses in Mexico are not built with chimneys, hence they have no fire places, and coal or wood stoves could not be used. Oil and gasoline stoves are thus used for heating purposes, the temperature in the early morning falling very low at times. Vienna enameled ware sells readily in the capital and in the larger cities, and I see no reason why our American stamped ware should not take its place. A portable sheet iron baker or oven, with a small chimney attachment, one that could be set over the opening above the charcoal fire of the stationary brick ovens of the Mexican kitchens, would be a good seller, as they really have no means of roasting a fowl or large piece of meat. I know of one party who has sold several carloads of such ovens, gotten up by himself, at a good profit, too. A hint that might prove valuable not only for Mexico, but for all hot countries, is that refrigerators are used only by the saloon and restaurant trade; private families do not use them to any extent. The lady of the house, followed by her servant, goes to market each morning to buy her necessaries for that day and that day only; nothing is ever kept over. Vegetables and fruits are to be had fresh all the year round, therefore no one lays in a supply ahead. Small ice making machines are in great demand, such as are not too expensive or bulky. These sell all over the interior table land and in the *tierra calienta* (hot land). Mexico City has good water works, and has plenty of pressure in the pipes, but the sewerage is very deficient. The city lies as in the bottom of a soup plate, so to speak. When the drainage canal is completed, which is promised for the near future, the city's sewage can flow off instead of having to be raised by powerful pumps. Then there will be a demand for modern plumbing.

Corrugated iron is used very extensively in Mexico for roofing. Half the year it is dry and the other half it rains in torrents, and iron stands it best. Cornice and structural iron is used further north to a larger extent, perhaps, than it is used here now. Windows are all provided with balconies having fancy railings, and the corridors of the inner courts are also handsomely ornamented. Iron urns for potted plants are used largely.

It will take some time to get American goods properly introduced, as this market has been so long neglected and Europe is in the saddle. However, by dint of circulars and catalogues, and by personal drumming, we are getting there, and American machinery in the coffee and sugar lines, cotton, grain and general farming lines, is taking the lead. Our tools of nearly every description are sought for. The Mexican is artistic, and he likes our tools because they are light, well made and handy. American trimmings are used in all new buildings, and bronze butts, &c., are taking the place of the old fashioned hand forged hinge and ponderous lock. I will not enumerate the carriages and wagons, the furniture, glassware and jewelry, sewing machines, mining machinery, railway supplies, wire, &c., that find a market here. Bicycles are the rage, and in Mexico can be used the year round. Steady hammering, the study of Spanish and a little unbending and concession upon the "you do the business our way" style of the average American, will find the Mexican and his brother further south *ready and willing* to purchase the goods his northern neighbor has to offer in exchange for the products of his own sunny clime.

A Fire Proof Dwelling.—We have referred at various times to the increasing use of structural shapes in the smaller classes of buildings. The very

low cost of steel has enabled it to be introduced to a gratifying extent in structures of a business character, apartment houses, &c., in which wood would continue to be used if much difference existed in cost. The fact can now be made public that the first dwelling house of steel construction is in course of erection in Chicago. It is to be strictly fire proof and is expected to mark the beginning of a new era in thia type of buildings. The house is not a cheap one, as it will cost close to $40,000, but the use of steel and the fire-proofiog have added but $2000 to the cost if built in the old way. The arcbitecta are Beers, Clay & Dutton of Chicago, who have designed and erected many notable buildinga in that city and in other parts of the country. They may justly be considered pioneers in this new field.

Cupola Heat and Quality of Cast Iron.*

W. J. KEEP, DETROIT.

The statement was made some weeks ago that a casting made at the last part of a heat was stronger than if made at the first part. An analysis proved that the iron from the early part of the heat contained 2.80 per cent. of silicon while that from the laat carried 2.70 per cent. Thia would not account for any variation in atrength. We are apt to jump at conclusiona. It has generally been stated that aa the cupola bccame hotter the iron would contain more silicon, but thia analysis and those whlch I shall present both ahow thia to be an error. This is alao a case where we are deceived by the fracture, for the grain of the casting made early in the heat is closer and lighter in color than that made later on. We shall prove that the difference is caused by the variation in heat at which the iron waa melted, not the heat of the iron when it was put into the mold.

When a cupola begins to melt, everything is comparatively cold. There is no alag and the blast has free access to all parts of the cupola. The dropa of melted iron are exposed to this cold blast as they fall among lumps of fuel and on the sand bottom, all of which are colder than the fluid metal. The firat iron drawn from a cupola has been melted under such conditions, but in half an hour the melted iron is covered with a protecting slag and the heat increases until the blast is off. The following series of teats are each averages of from three to aix test bars, made at various times, to determine the influ ence of varying heat. In each case the first set of test bars was poured from the first iron after about 400 pounds had been taken. The last was in each case taken after the wind was off, and just aa slag began to show at the tapping hole. The intermediate teats were taken at regular intervals, the heat lasting about 3½ hours. In some cases, therefore, a test was taken every 20 minutes, and in others they were over an hour apart. In series IX, X and XI the tests were about one hour apart. Two things are evident: There is no uniform variation in strength. There is in each case a decreaae in shrinkage and chill.

In calculating the mixture of the pig iron alone I used analyses which I have of each iron used. To arrive at the regular mixture 40 per cent. of remelt is added, and deductions are made for loss of carbon and silicon, and addi-

Tests of Iron During the Melt.

Number series.	Number test.	Number tests in each heat.	Dead load. Strength.	Dead load. Def.	Impact. Strength.	Impact. Def.	Shrinkage. Square.	Shrinkage. Flat.	Chill.
Series I.	271	First set	353	0.19	322		0 158	0.163	0.10
	272	Second set	365	0.20	314		0.129	0.148	0.10
	272½	Third set	373	0.23	271		0.133	0.150	0.10
	273	Fourth set	371	0.22	347		0.124	0.146	0.07
	274	Fifth set	412	0.26	382		0.123	0.143	0.05
	275	Sixth set	442	0.26	356		0.124	0.140	0.02
Series II.	222	First set	381	0.21	254		0.183	0.197	0.25
	223	Second set	378	0.21	296		0.166	0.157	0.05
	224	Third set	360	0.20	271		0.177	0.170	0.05
	225	Fourth set	343	0.20	263		0.175	0.169	0.09
	226	Fifth set	355	0.20	288		0.166	0.164	0.08
	227	Sixth set	369	0.21	314		0.164	0.161	0.10
	228	Seventh set	372	0.22	288		0.162	0.160	0.10
	242	Eighth set	313	0.17	246		0 173	0.168	0 15
Series III.	276	First set	415	0.22	322		0.167	0.168	0.15
	277	Second set	390	0.22	322		0.157	0.159	0.10
	278	Third set	351	0.19	296		0 155	0.154	0.05
	279	Fourth set	369		322		0.159	0.156	0.10
	280	Fifth set	355	0.20	264		0 153	0.156	0.15
	281	Sixth set	390	0.23	245		0.143	0.152	0.10
	282	Seventh set	381	0.22	314		0.158	0.158	0.06
	283	Eighth set	380	0.22	305		0 148	0.153	0.03
	284	Ninth set	381	0.21	331		0.130	0.148	0.20
Series IV.	311	First set	402	0.22	313		0.160	0 168	0.15
	312	Second set	366	0.20	330		0.139	0.153	0.15
	313	Third set	387	0.22	280		0.133	0.150	0.08
	314	Fourth set	382	0.21	339		0.133	0.150	0.08
	315	Fifth set	365	0.20	347		0.132	0.148	0.10
Series V.	316	First set	354	0.19	288		0.158	0.159	0.06
	317	Second set	385	0.22	314		0.143	0.150	0.12
	318	Third set	393	0.23	296		0.131	0.147	0.08
	319	Fourth set	403	0.25	313		0.131	0.147	0.08
	320	Fifth set	388	0.21	305		0.129	0 147	0.06
	321	Sixth set	399	0.22			0.134	0.142	0.09
Series VI.	322	First set	350	0.20	305		0.154	0.156	0.07
	323	Second set	333	0.19	245		0.150	0.154	0.05
	324	Third set	336	0.18	288		0.138	0.152	0.10
Series VII.	325	First set	353	0.19	296	0.161	0.161	0.165	0.16
	326	Second set	363	0.21	314		0.145	0.149	0.07
	327	Third set	338	0.20	288		0.154	0.154	0.08
Series VIII.	336	First set	360	0.18	288		0.156	0.162	0.10
	337	Second set	378	0.22	296		0.142	0.150	0.03
	338	Third set	348	0.20	321		0.142	0.152	0.07
Series IX.	788	First set	373	0.21	263	0.20	0.163	0.182	0.15
	789	Second set	369	0.21	280	0.21	0.137	0.147	0.04
	790	Third set	367	0.21	297	0.22	0.130	0.141	0.05
	791	Fourth set	398	0.22	338	0.25	0.121	0.140	0.07
Series X.	795	First set	431	0.22	373	0 24	0.158	0.165	0.08
	796	Second set	429	0 23	432	0.26	0.132	0.144	0.03
	797	Third set	448	0.23	424	0.26	0.126	0.140	0.03
	798	Fourth set	396	0.23	297	0.22	0.132	0.144	0.06
Series XI.	799	First set	415	0.23	373	0.24	0.159	0.165	0 07
	800	Second set	453	0.23	382	0.24	0.133	0 148	0.03
	801	Third set	455	0.25	398	0.25	0.130	0.141	0.05
	802	Fourth set	479	0.27	415	0.25	0.125	0.140	0.06

To reduce the strength of these test bars to a bar 1 inch square and 12 inches long multiply by eight. Each of the above tests (a set) consisted of five test bars ½ inch square and 12 inches long, and a companion flat bar 1 inch wide, 1-10 inch thick and 12 inches long. Three square bars are broken in a special autographic dead load testing machine, and two square bars are broken in an autographic impact testing machine. Only averages are recorded.

The following analyaes by Cary & Moore were of the bars 788 and 791, aerles IX:

Number test.		Total carbon.	Graphite.	Combined carbon.	Silicon.	Sulphur.	Phosphorus.	Manganese.
788	Actual analysis of test bars	2 910	2.280	0.630	3.220	1.025	0.123	0.49
791	Actual analysis of test bars	2.950	2.470	0.480	3.140	1.055	0.100	0.47
791	Calculated composition of mixture	2.476	2 110	0.366	3.130	0.911	0.078	0.450
791	Calculated composition of pigs alone	2.540	2.181	0.359	3.186	0.902	0.064	0.456

* A paper read before the Western Foundrymen's Association.

tions for the gain of phosphorus and sulphur, which are expected to take place. Evidently the pig iron is higher in carbon and phosphorus than the original analyses show, and more sulphur has been taken from the fuel than I calculated for. I did not figure on cumulative percentage of sulphur, which this and previous analyses indicate should be figured where a large portion of remelt is returned to the cupola each day. Since writing the above I have received four sulphur determinations of other tests of this same mixture, but made on other days, and the average of the four is 0.081, showing that the day that series IX was made a car of coke was used with the sulphur higher than usual.

It will be noticed that the tests for series IX show less strength than those of series X and XI. The reason for this is that each test in series IX was poured as soon as the iron was taken from the cupola, while in making series X and XI the molder poured other work from the ladle and then used the last iron for the test bars. Iron grows stronger as it stands in the ladle. To show this fact more clearly the following four tests were poured from a single ladle with 28 pounds of iron, the tests being poured one minute apart, or three and one-half minutes from the first to the last. Between times the ladle rested so that the iron could cool, but the iron was not agitated:

Number test.	Series XII.	Dead load. Strength.	Dead load. Def.	Impact. Strength.	Impact. Def.	Shrinkage. Square.	Shrinkage. Flat.	Chill.
784	First test.....	All from one ladle of 28 pounds cupola iron.	388	0.23	348	0.24	0 128	0.143	0.02
785	Second test.....		393	0.21	331	0.23	0.128	0.140	0.02
786	Third test.....		424	0.21	406	0.25	0.128	0.135	0.025
787	Fourth test.....		466	0.24	347	0.24	0.129	0.136	0.02

The iron of series IX being poured immediately after it was caught corresponds to test 784 of series XII, while those of series X and XI are more like 786 and 787.

Cary & Moore found the silicon of test 784 to be 3.46 and the sulphur 0.079, while test 787 has silicon 3.45 and sulphur 0.083. You will notice that the shrinkage and chill of the square test bars do not change, though the more sensitive flat test bars show some decrease. The difference in strength in this case is in no way occasioned by change in chemical composition, but is no doubt due to the internal stress in the first test bar (784) caused by a rigid shell forming about very hot metal, which latter in shrinking causes a stress between the grains, while the last test bars (787) are so cold that the metal at the center does not shrink much. The difference is strength is therefore due to the physical structure.

Now recurring to the analyses of 788 and 791, we should not be too sure as to indications without other analyses of other tests. But the similarity between these silicons and the silicons (7.80 and 7.70 per cent.) first referred to lead us to expect similar results again. The indication is that the carbon burned out slightly before the slag covered the iron, and it is quite certain that we get all the silicon in the casting while the cupola is cold, but that it was burned out somewhat after the cupola became hot. Also it is evident that less sulphur is taken up in a hot than in a cold cupola.

The combined carbon is slightly greater in the iron having the most silicon, showing that the increase in combined carbon is due to the conditions in the cupola, and not to chemical composition. The increased chill is also due to these conditions and not to combined carbon or to sulphur.

Chill is probably a unton of carbon and silicon and iron under a peculiar cooling influence, and is not the same thing as the determined combined carbon. With the cooling conditions present at the beginning of this heat, the iron is in such a state that it will take a chill, and often such iron as 788 will solidify with the exterior surface a soft gray, while the interior will be a perfectly white core, the silicon being the same in both. Iron that favors a white core comes at the beginning of the heat when silicon is high, but it is a rare thing to get the conditions that will cause it. As soon as the cupola is hot, half an hour after the iron comes down, such a union cannot be formed.

In tests of pig iron it is difficult to trace chill to the influence of combined carbon, or to any other element. We might perhaps compare the conditions existing when the test bars 788 were made to a blast furnace with cold blast, which makes a chilling iron. The conditions afterward are a little more like a furnace with hot blast, which makes an iron with less chill. The question of sulphur should be settled by these tests and analyses. The sulphur is higher than usual, but there never were better castings made, and there is not a sign of chill or hardness or strain. This is the same mixture from which the strong castings were made for which I asked a chemical prescription a few weeks ago.

Understand that I do not say that the sulphur is the cause of the strength of these castings. I only claim that the quantity ordinarily found in gray castings exerts no influence, and can be ignored. Instead of laying the blame on sulphur in the fuel, it should be ascribed to lack of carbon in the fuel, which produces a cold cupola, which is likely to make just such iron as 788.

I do not wish to discuss the sulphur question at this time, because I shall bring forward a large amount of testimony to prove the correctness of my conclusions, at the meeting of the Philadelphia Foundrymen's Association on April 4. The good qualities of this iron are not due to chemical composition but to physical composition, which can always be brought about by careful mixing.

The casting 791 has as low shrinkage as can be found in any ½-inch test bar from a cupola. This iron had remained in the bottom of the cupola three or four minutes after the wind was off. Some chemists may figure that the slight variation in the chemical composition would account for the variation in the physical characteristics, but we shall, at another time, prove that this is not so. The change is chiefly if not wholly due to physical effects, brought about by the change in heat in the cupola. Very great changes in strength can be obtained by manipulation. From this same mixture I obtained the strong test bar which has been referred to, by simply a slight agitation of the metal in the ladle with a steel bar for 30 seconds. These tests illustrate the sensitiveness of a ½-inch test bar, which by its variations in shrinkage will indicate the exact influence of each chemical element in the iron, and is the most sure method of controlling a foundry mixture.

I will say only a word regarding the papers introduced at the last meeting. I am not in any way opposed to chemical work; I could do nothing without it. None of the conclusions of this paper could have been reached until the full analyses of the test bars were received. Chemistry alone has made little progress in the study of cast iron, and many of its conclusions have been wrong. With the ordinary large test bar physical tests have taught but little. With a small sensitive test bar, by the help of chemical analysis, very much has been done. What I claim is that a labratory in an ordinary gray iron foundry, with a chemist such as would naturally be employed, would accomplish less than could be done through the use of the ½-inch test bar alone. The manner in which some founders use a little chemical data is very discouraging. I fully agree that each founder should have a thorough chemical education, but they should acquire the habit of using it in a practical way. For example, Mr. Wheeler proposed a theory that all iron coming from a furnace contained an equal amount of sulphur and that the more fluid No. 1 iron allowed its sulphur to escape, &c. Now, he has the iron running each day, and has a labratory. Why should he, of all others, theorize regarding sulphur when he could prove it and thereby add to the general knowledge?

Mr. West claims to have a laboratory, and yet in a letter to the *Iron Trade Review*, February 22, 1894, ascribes the variation in strength which is the subject of this paper to the variation in the metal charged, claims that his records show more silicon in a hot cupola and then reasons from this fact. If such men jump at conclusions with a fully equipped laboratory at their command, it is discouraging for others to begin their use.

Mr. Bolland theorizes regarding chemistry, with which he owns he is not very familiar, and then says that personally he found no trouble in controlling his mixture by test bars. This personal experience of a practical founder is worth more than all that he imagines could be done.

The annual meeting of the New York Metal Exchange occurred last week. The reports of the officers showed that the trade in metals had been retarded by the general business depression of the past year. The condition of the Exchange's finances was reported as good. The membership has increased to 300. It was announced that an offer of $70,000 had been refused for the exchange building, which was purchased eight years ago for $42,000.

Galvanizing works in New York have been quite busy for the last week or two after six or eight months of almost unexampled dullness.

THE LETTER BOX.

Flat Seam Roofing Questions.

From J. F. S., *Lakewood, N. J.*—Having seen the letters of "S. P. K." and "G. R. J." in *The Metal Worker* January 27 and February 10, I contribute the following from my experience. It takes about 5 minutes to notch or cut the corners off a box of 14 x 20 tin, about 23 minutes to edge it, and about 3 minutes to book it, putting 28 sheets in a book, but I think better time can be made by a man in practice. We easily average 300 to 350 square feet of 14 x 20 tin on a plain roof in a day, using 3½ pounds of solder to 100 square feet and four nails to a sheet. I have seen 538 square feet of 20 x 28 tin put on in nine hours, four nails to a sheet, on a roof that had one chimney, a gutter strip and a back strip finished under weather board of a house. I think a man and a helper using "kickers" can easily average 100 square feet per hour all day on a roof that does not pitch more than 3 inches to the foot. It is some years since I worked where flat seam roofing was put on in strips 20 inches wide, but I think that on hipped roofs I can lay as much tin in a day by the sheet at a time method, and am sure that it would make a much firmer and less noisy job. When the tin is expanded in summer and the wind is blowing a roof will rattle that has a 19-inch space that is not anchored to the sheathing, but the rattling cannot occur with a roof of 14 x 20 tin put on one sheet at a time. No doubt many roofers are satisfied with their methods of getting the tin ready and putting it on, and could give some interesting details in *The Metal Worker*. The question is will they kindly do it?

The Hyde Park Boiler.

From D. E. M., *New York*—I notice an inquiry in *The Metal Worker* of March 24 for the manufacturer of the Hyde Park hot water boiler. This boiler, I think, is made by E. D. Howatt, Hyde Park, N. Y.

Tempering and Threading.

From E. E. H., *St. Louis, Mo.*—Will *The Metal Worker* please tell me what process is used in tempering taps and dies. Please give me a rule to use in figuring out the wheels to cut different threads on a lathe, also a rule for cutting gear wheels on a gear cutting machine?

Answer.—Successful tempering is only accomplished as the result of closely observed experiment. After the article to be tempered is finished it is hardened by heating to a red heat and plunged into cold oil. It is then heated and the hardness drawn until the desired color is shown, which is some tinge of the color commonly known as straw color, when it is again cooled in oil.

All lathes of modern construction are provided with an index plate, with which the following rule is generally used:

Read from the lathe index the number of threads per inch cut by equal gears and multiply it by any number that will give for a product a gear on the index; put this gear upon the stud, then multiply the number of threads per inch to be cut by the same number and put the resulting gear upon the screw.

Example: To cut 11½ threads per inch. We find on the index that 48 into 48 cuts 6 threads per inch.

$6 \times 4 = 24$, gear on stud,
and $11\frac{1}{2} \times 4 = 46$, gear on screw.

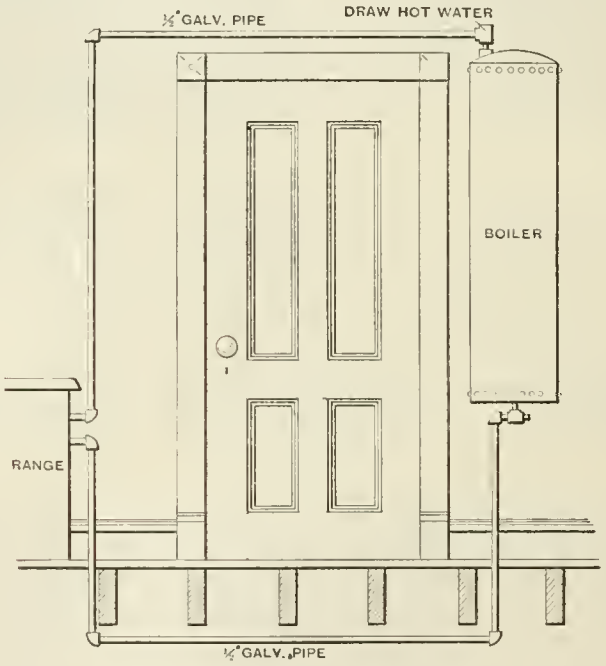
Any multiplier may be used so long as the products include gears that belong with the lathe. For instance, instead of 4 as a multiple we may use 6.

Thus, $6 \times 6 = 36$, gear upon stud,
and $11\frac{1}{2} \times 6 = 69$, gear upon screw.

Gear cutting machines are also provided with an index having holes arranged in concentric circles around a center, each circle having a different number of holes. In use a pin enters these holes to hold the blank gear stationary while the notch forming the side of two teeth is cut. To use the index divide the number of teeth to be cut into some number on the circles on the index plate which can be divided without a remainder and the quotient will be the number of holes apart on that circle the pin must be inserted to cut the gear. For instance, if 19 teeth are wanted the circle containing 76 holes can be divided and 4 will be the result without remainder, consequently in using the machine the pin must be inserted in every fourth hole on that circle to cut 19 teeth.

Small Air Bound Pipes.

From BRAMHALL, DEAN & Co., *New York.*—Referring to the letter of "E. J. S.," page 30 of *The Metal Worker* of March 17, I take the liberty of inclosing a tracing showing the ordinary manner of connecting such jobs. The outlet used for drawing hot water of course relieves the pipe of air from time to time as water is drawn. I believe boilers were connected in this manner long before the "side coupling," as it is called, was used on the boiler. It is not always that a closet door is between the range and boiler, but it frequently happens that a window prevents the carrying of the hot water circulation to the boiler, so that this plan of getting over the top is adopted. As you say, the "pipe is too small," and possibly the water back may not be of the right sort.



Small Air Bound Pipes.

Beating Up Sheet Lead.

From F. W. H., *Lancaster, Pa.*—I would be glad to receive information in *The Metal Worker* as to what method, material or liquid should be used for stretching or forming sheet lead that will give better results than simply using a dresser.

Note.—Our sheet lead working readers are invited to make suggestions on this subject. A tank about 36 inches square and 10 inches deep that is very true in form is held at the New York Trade School as a very excellent piece of work by one of its pupils. This was

beaten up without the use of any other material than the lead, and the tool used was a dresser. Such a piece of work is very tedious, and requires much skill and judgment.

Beyond a Syphon's Limit.

From V. & B., *Binghamton, N. Y.*—We send *The Metal Worker* a diagram of a line of water pipe by which we desire to syphon water from the creek over a hill. It is our impression that it will not work. At a point A on the diagram there is a creek, and it is proposed to dam it so as to form a pond, then water is to be taken through a 2-inch pipe over the hill to a point marked C. From the level of the creek to the top of the syphon is 70 feet and from the top of the syphon to the point of delivery is 170 feet. There is a spring some 50 feet higher up, and we have shown a 1¼-inch pipe running into the syphon pipe about 10 feet from the top to start the syphon working. Another pipe of the same size, from the spring, connects with the syphon about 80 feet below the top of the syphon. Which would be the better place to connect this pipe, and would it be practicable to take out sprinkling pipes from the main before reaching the level of the water in the creek?

Answer.—We have not reproduced our correspondents' diagram, as the description is sufficient. The principle on which a syphon works is that the water falling through the long leg has a tendency to create a vacuum at the top of the syphon, which is filled by water from the short leg being forced up by the atmospheric pressure on the surface of the water in which the short leg of the syphon is immersed. The limit to which water can be raised by atmospheric pressure at the sea level under favorable circumstances is about 34 feet, consequently a syphon of the length here described would not work. The idea of connecting a pipe from the spring to start the syphon is ingenious, and in all probability would prove efficient if the syphon were within working limits. To connect a sprinkling pipe with the long leg of the syphon before reaching a point below the level of the water supply would destroy the syphon, and if connected at a point where it did not destroy it, it would only produce a very weak flow of water and would not have sufficient force to form a spray.

Hot Water From Cold Faucet.

From OLIVER TWIST.—In answer to the inquiry of "L. J. P." in *The Metal Worker* March 17, would say that the particulars given are very few on which to base an intelligent opinion. I have known such a trouble to arise from the pipe inside of the boiler being attached to the wrong connection, or attached to the connection marked hot in the sketch. If upon investigation the boiler pipes are found to be properly connected, then the fault is due to lack of water pressure. The cold water going to the boiler must flow past the branch to the sink, and if the faucet is opened the pressure on the system is instantly reduced, and so much that the hot water backs along the piping from the boiler to the faucet.

From H. I. M., *Alabama.*—Having seen the inquiry of "L. J. P." in *The Metal Worker*, March 17, under the head of "Hot Water From Cold Faucet," I thought like the Hoosier from Indiana that it was about time that Alabama had been heard from. With the low pressure reported and the cold faucet so close to the boiler, that hot water should come from it is not strange. The hot water simply backs into the supply pipe and over to the faucet shown in his sketch. I have known hot water to back along the supply pipe to the hydrant in the yard where the boiler was small and the water back in the range had a great capacity. One remedy is to cut out the short branch to the faucet and run a pipe to the faucet from a point further back on the supply. Another way would be to put a check valve on the supply pipe, but this might cause a burst in some part of the system if it was full of cold water and a good fire was started unless some provision was made for the expansion of the water as it became heated. A safety valve could be placed on the hot water pipe at the sink so that when it was opened by expansion the overflow would do no harm. Another way would be to run a pipe from the boiler to the tank and turn the end down over it so that air and steam could escape from the boiler and the overflow from expansion would fall into the tank. Now let some other representative of the great Southeast do his duty and show the readers that the great Northwest is not the only section that is entitled to be called great.

Fails to Bake on Bottom.

From WM. D. SOUTHARD, *Peekskill, N. Y.*—On page 30 of *The Metal Worker* of January 20, W. S. Guelph complains of range not baking on bottom of oven. There are a variety of reasons for this, but one reason which does not appear to have been thought of is the length of the flue strip in the bottom flue. We have remedied just that difficulty sometimes by lengthening the flue strip and in other cases by shortening it. A patent has been granted to me under date March 13, 1894, No. 516,233, the specifications of which explain its operation. Would be glad to hear from Mr. Guelph and others.

Smoky Chimneys.

From J. R. S., *Stonington, Conn.*—Some years ago I built for myself a house, and soon after moving in it was found that the kitchen chimney smoked furiously when the wind came from a certain quarter. I had the top carried up several feet higher, but the evil was not remedied. Resort was then had to two or three ventilators, one of which proved to work very well. This continued for about a year, when the ventilator dropped from the chimney, and upon examination it appeared to be nearly eaten through from the effects of the products of combustion and atmospheric influences. I did not feel like expending more money upon patent ventilators, but after looking into the laws which govern the movement of air, I simply and effectually remedied the evil by contracting the mouth of the flue. This was done by inserting and cementing in the flue a short section of 6 inch Akron drain pipe. Since then I have had no trouble with gas and smoke. A number of my neighbors have suffered from these things, and are now adopting the plan which I have described. The reason for this simple and efficient remedy is plain enough. By the means employed the velocity of the current of air at the mouth of the chimney is made so great that unusual winds do not interfere with it.

Trouble With Pump.

From J. S., *Kansas City, Mo.*—In reply to "F. B. K.," who reports "Trouble with Pump" in *The Metal Worker*, March 24, his trouble is caused by air in the pipe, and if his valves are tight and he makes the change which he suggests he will have no further trouble.

Coloring Brass.

From A. B. F., *Brooklyn, N. Y.*—Please inform me in *The Metal Worker* how I can color a brass hand rail on a porch, black or dark color other than by painting, lacquering or oxidizing. It is an outside railing and cannot be taken down without a great deal of trouble and expense, hence my desire to color it in place with the least expense and delay.

Answer.—The following receipts from a receipt book may answer the purpose: Brush the object over with a solution of 1 part of platinum chloride in 5 of water. When dry rub it with a piece of flannel moistened with a drop of oil. The manipulations are to be repeated until the formation of a uniform dead black results. The railing must first be made clean, bright and free from grease or dirt. To obtain a brown color, add acetic acid to 11 drams of spirit of sal ammoniac until blue litmus paper dipped in it turns red. Then add 5½ drams of sal ammoniac and sufficient water to make 2.11 pints. With the fluid thus obtained, repeatedly moisten the surface, rubbing after each application, until the desired brown is obtained. A green is obtained by applying a solution prepared by dissolving 10 parts of copper in 20 of nitric acid, diluting the solution with 150 parts of vinegar and adding 5 parts of sal ammoniac. Allow the article to stand until a green coloration has made its appearance, brush with old linseed oil, then after a few days rub with a piece of soft flannel.

Galvanic Action.

From COPPER, *New York.*—We are invited to bid on the work for a building where the specifications call for the conductors and valleys to be of copper and the cornice which attaches to the copper gutter to be of galvanized iron. Will there be galvanic action between the copper and the galvanized iron that will eventually destroy the iron?

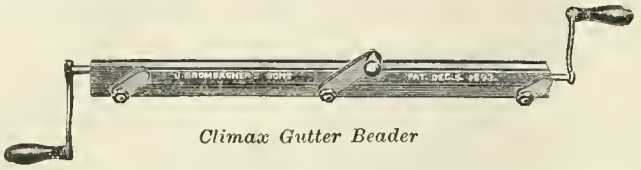
Answer.—That a galvanic action will take place is certain, and the length of time that the iron will last will depend on its endurance due to its thickness.

THE PLUMBERS of Lowell, Mass., are progressive. They have organized a base ball team, and are to give their fifth annual social on the eve of Lexington Day, April 19.

THOMAS M. ALLEN has opened a plumbing establishment at 719 Penn avenue, Wilkinsburg, Pa.

Climax Gutter Beader.

Jacob Brombacher's Sons, 30 Cliff street, New York, have brought out the Climax gutter beader, here shown. While similar to the familiar iron bottom gutter beader, it differs from the latter in that the two sides are not riveted or screwed permanently together. At each end is a wrought bolt riveted to the back portion. The front half travels on these rods or bolts. On the front section are cast two eccentrics

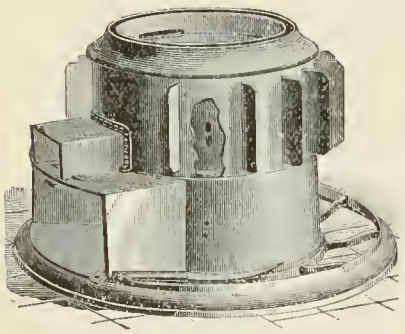


Climax Gutter Beader

with which the cam levers at either end articulate. The end levers are connected by a wrought bar about 1 x ⅛ inch in size. Throwing the center lever to the right closes the beader, while a movement to the left spreads it about ¼ inch larger than the work to be taken out. They can be furnished in any of the regular sizes from ⅝ to 1 inch rods, and from 20 inches long to 6 feet if necessary.

The New Idea Furnace.

In the accompanying illustrations we present views of a furnace which is being introduced to the trade under the name New Idea, by Schill Brothers, Crestline, Ohio. As placed upon the market, this heater embodies some improvements which have been added for 1894, and which the manufacturers expect will render it more popular than ever. Special reference is made to the



The New Idea Furnace.—Fig. 1.—View of Fire Pot.

fire pot used in the New Idea, the statement being made that it is double, consisting of an inner heavy cast iron pot, with a series of openings near the center and larger ones at the top. Surrounding the fire pot is a steel jacket forming an air heating chamber, into which air is admitted and raised to a high temperature before reaching the fire, thus facilitating combustion. In this way, the makers state, fully 90 per cent. of the gases and smoke heretofore wasted is consumed. By means of an opening and closing ring between the fire pot and steel jacket the draft can be so regulated as to burn any kind of fuel. Shaking this ring once or twice a week will prevent any ashes which may find their way into the air space between the fire pot and steel jacket from lodging at this point. The same ring when opened forms a dust flue. A good idea of this fire pot may be obtained from an inspection of Fig. 1. In Fig. 2 is shown the base of the furnace, together with grate and draft ring, the grate being shown dropped. The cut also presents a bottom end view of the drum, showing the inside flue. The grate employed is referred to by the manufacturers as being simple in construction and easy of management. By a simple device the center of the grate can be dropped and ashes and clinkers removed without disturbing the whole of the fire, or the entire grate can be shaken without opening any of the doors. The drum employed in this heater has been designed specially for the purpose and is so constructed, it is said, that every inch is available heating surface. It consists of an inner and outer heavy steel plate drum, the two being connected by steel wings drawn tightly together in such a way as to form air ducts and largely increasing the amount of heating surface. The latter, from the bottom of the ash pit to the top of the radiator, is in a straight line, there being no tubes, crooks or turns to prevent the free flow of large volumes of air. Another important feature of the drum is the diving flue, which extends to the center at the top of the drum, thus drawing the heat to that point and rendering all parts of uniform temperature. Every joint in the furnace is made with special asbestos wicking, which, it is claimed, makes a joint that will not leak. Expansion and contraction have been guarded against by making the lower drum head in sections, while the center of the upper drum head is raised. The outer rim of the upper drum head is also cut, thus guarding against cracking. The casing of the furnace is composed of one sheet of galvanized iron, one sheet of corrugated iron and one sheet of asbestos placed between the two, and all securely riveted together. The corrugated sheets are claimed to admit a free and uniform passage of air between the two, while the asbestos, being a non-conductor, prevents loss of heat by radiation into the cellar.

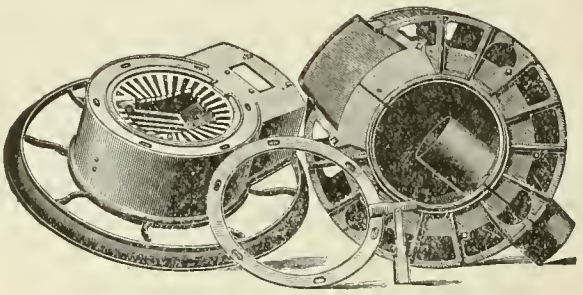
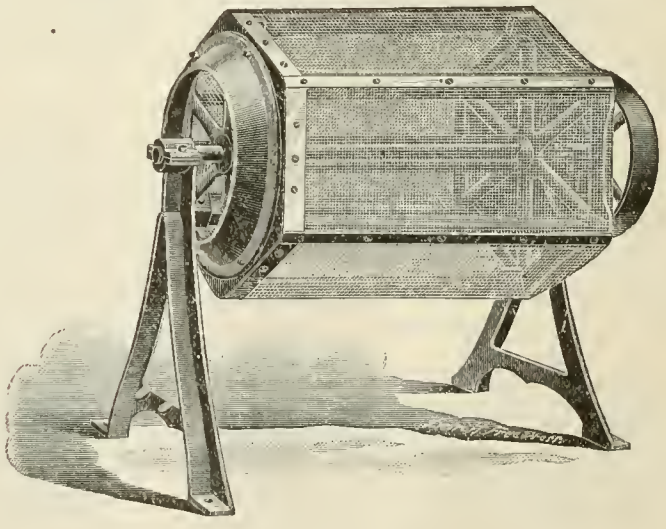


Fig. 2.—View of Base, with Grate and Draft Ring, the Grate Being Shown "Dropped."

A New Sand Sifter.

The Detroit Foundry Equipment Company of Detroit, Mich., and Chicago, Ill., recently placed on the market the sand sifter here shown. It is of the revolving type, having a funnel at one end into which the sand is shoveled, and being slightly enlarged at the other end to allow the gravel and dirt to work itself out free of the sand. It differs from the ordinary radial machine, as it is provided with inside revolving radial screens of a larger mesh than the outside screen, and which thoroughly break up and pulverize the sand before it has an opportunity of falling through the outside screen. This type of screen has been in use for some time in several foundries in Detroit and elsewhere and has been found of special value in mixing up sand for facing, &c., also in mixing core sand. The screen is made so that it may be set on brackets or be suspended in hangers from above, and is suitably provided with pulley, &c., complete, ready to set up. It can be made of any length or fitted with any size screen suitable for the work to be performed.



A New Sand Sifter.

ROOFING AND CORNICE.

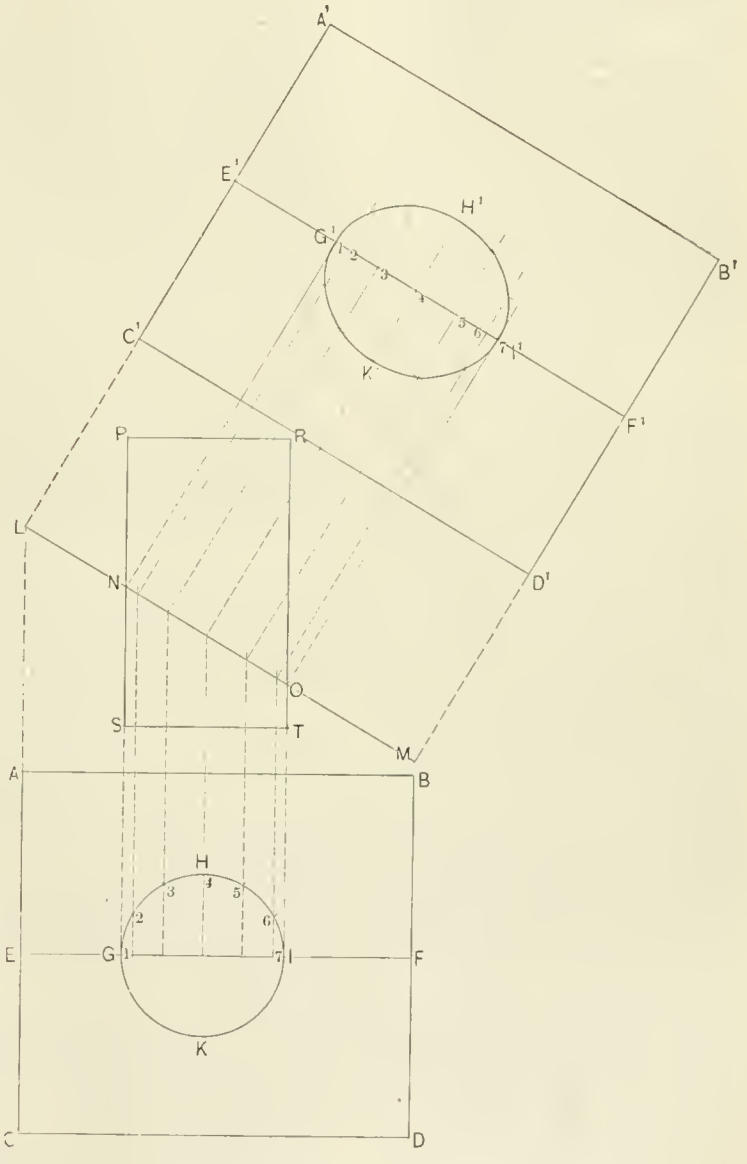
Repeal of a Sheet Metal Ordinance.

The cornice makers of Chicago have won a signal victory over their opponents. About a year since the City Council adopted an ordinance, against the protests of the cornice makers, prohibiting the use of sheet metal for bay windows and light shafts. Up to that time a heavy business had been done in furnishing galvanized iron and sheet copper bay windows on wooden frame work and corrugated iron light shafts with wooden backing. Several shops were fitted up with special machinery for turning out work of this character in the quantities demanded by their continually growing trade. It is claimed that the prohibitory ordinance was passed in the interest of the brick and terra cotta manufacturers. Be that as it may, the effect was to throw this business into their hands, and thousands of sheet metal workers in Chicago were without employment. In view of the fine prospects for building this spring, the cornice makers bestirred themselves, created a sentiment in their favor, demonstrated the fact that metal covered bay windows and light shafts were not combustible, and at length succeeded in inducing the City Council to remove the interdiction against their business. The only restriction made in the new ordinance is a limitation of metal covered windows to buildings not over four stories in hight.

Shape of Opening in an Inclined Roof.

From J. T., *Warren, Mass.*—I would like to see published in *The Metal Worker* a method for obtaining the shape of opening in an inclined roof through which a round pipe is to pass. The method should be such that the shape of opening can be described on a piece of sheet metal for a pipe of any size and for a roof of any inclination.

Answer.—Referring to the accompanying diagram, let L M represent the inclination of the roof and P R T S an elevation of the pipe passing through it. Then M O represents the length of the opening which is to be cut in the roof, the width of which will be the same as the diameter of the pipe. Let A B D C represent the plan of the roof as it would appear if viewed from a point directly above the pipe. Immediately in line with the pipe draw the profile G H I K, placing it in the center of the roof. Divide one-half of the profile in the usual manner and carry lines vertical to the line L M representing the pitch of the roof, and thence at right angles to it indefinitely. Carry points in the same manner from A and B. Draw C^1 D^1 parallel to L M and make C^1 A^1 equal to A C. Now draw A^1 B^1 parallel to C^1 D^1. Draw E^1 F^1 at a point corresponding to E F of the plan of the roof, crossing the lines drawn from the profile. From E^1 F^1 set off on each side on each of the measuring lines crossing it the width on corresponding lines measuring from E F in the plan to the profile. Through the points thus obtained draw a line, which will give the shape of the opening to be cut, as shown by G^1 H^1 I^1 K^1.



Shape of Opening in an Inclined Roof.

FLASHINGS.

The Columbia Roofing Company, Canton, Ohio, distribute their catalogue which is an enlarged edition of their former publications. The first notice is given to the Columbia steel roofing, illustrations showing the formation of the seam. Then comes the Columbia double seam roofing similarly illustrated; then pressed standing seam roofing, V-crimped roofing, and after that is noted corrugated iron. Then come beaded iron siding and steel ceiling, weather boards, &c. Considerable attention is given to flashings and ridgings. Brick siding is illustrated and iron shutters and doors. A number of handsome designs of crestings, cresting blocks and finials are shown. Hip caps, cornices and other goods are illustrated and briefly described. The pamphlet closes with an alphabetical index.

The eighteenth annual catalogue, reference book and price list of the Canton Steel Roofing Company, Canton, Ohio, is issued to the trade. In the beginning of the pamphlet the announcement is made that after one year's business with insufficient facilities, following the total destruction of their plant by fire, which frequently prevented the prompt filling of orders, the Canton Steel Roofing Company take pleasure in announcing that their works are now rebuilt and fully equipped, giv-

ing them better facilities than ever before. The catalogue is divided into two parts, the first beginning with illustrations and descriptions, &c., of the H. W. Smith Patent Folded Lock Standing Seam Steel Roofing. A number of roofing specialties, including paints, are noticed in this connection. Attention is given to corrugated sheets of various sorts, and illustrations show their application. Ridge rolls, flashings and cappings are illustrated; likewise crimped sheets, beaded iron, sheet steel, pressed brick, siding, shingles and doors and shutters of various kinds. The second part describes a full line of eave troughs and conductor pipes, eave trough hangers, conductor fasteners, ventilators, creatings, vanes, finials and other coated sheet metal goods, and attention is also directed to galvanized steel, terne and tin plate, copper, solder, sheet aluminum, &c. The catalogue, which closes with an alphabetical index, is a handsome publication of 100 pages bound in colored paper with stamped and gilded title.

The Illinois Roofing & Supply Company, 203 Lake street, Chicago, have secured the agency of Balm's extension ladders, and will keep a full stock on hand from which the trade can be supplied. These ladders are provided with automatic locks, which are claimed to be quick and certain in action, and have no springs to get out of order. The two section ladders are made in lengths of from 26 to 38 feet, and those of three sections from 42 to 50 feet in length.

The continuous roofing tin manufactured and placed on the market by Merchant & Co., Incorporated, of Philadelphia, and known by the brand name of Tandem, is reported as being very favorably received by the trade. The sheets, which are 96 inches long, are recommended as specially adapted to gutters and valleys. There being fewer seams and these being soldered on both sides during the process of coating, the liability to leaks is lessened. Moreover, the courses are absolutely straight. The advantages of this material, it is said, being widely appreciated by country tinners, to whom the saving of labor in soldering, time and material effected by its use is a great consideration. In this connection Messrs. Merchant's New York representative states that the sales of their continuous roofing tin have increased of late by leaps and bounds, in the New York and New England rural districts especially. Merchant's new patent Spanish metallic tiles are also reported as receiving the favorable notice of architects and roofers. They are made in tin or copper and the firm are now bringing a line of them out in enameled steel, which they believe will prove equally successful.

The American Roofing Company, St. Louis, Mo., and Cincinnati, Ohio, have just issued a little catalogue devoted to their gutter department. Diagrams are given showing the width and size of eave troughs, and general views are presented of the different styles. Attention is likewise directed to lap joint miters and eave trough hangers of different sorts, all being illustrated and priced. Corrugated conductor pipe, elbows and shoes, conductor heads are similarly noted, also hooks, strainers and cut offs. The pamphlet will be found especially serviceable, as all its contents relate to one general subject.

C. L. Rickert, 194 Clark street, Chicago, has the contract for the copper, slate and galvanized iron work for the Tulane University, New Orleans, La.

HEATING and PLUMBING.

NEW WORK AND CONTRACTS.

G. A. Hall has awarded the contract for the construction of his new block on College street, Burlington, Vt., to E. P. Libbey of West Randolph, and the contract for the plumbing and heating to the G. S. Blodgett Company.

Proposals for heating and ventilating the new school house of the town of Hadley, Mass., will be received up to April 7.

The town meeting of Lowell, Mass. recently voted an appropriation of $500 for heating School No. 8.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until April 12 for a low pressure steam heating and ventilating apparatus for the United States Court House and Post Office building at Martinsburg, W. Va. Drawings and specifications may be obtained from the Supervising Architect, Washington, or can be had from the superintendent at Martinsburg.

A. F. Waters, La Porte, Ind., has secured the contract for plumbing the new Lutheran school.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until April 13, for a low pressure steam heating and ventilating apparatus for the United States Post Office building at Staunton, Va. Drawings and specifications can be had from the Supervising Architect, Washington, or obtained from the superintendent, Staunton.

Edward A. Monroe, superintendent for John A. Scollay, 74 and 76 Myrtle avenue, Brooklyn, reports that their improved hot water heater has been installed in the residences of T. H. Howard, at Parkesville, and Hon. W. J. Kaiser, at Flatbush, L. I.

The town of Braintree, Mass., has appropriated $5000 for new heating, ventilating and sanitary arrangements in the Union and Pond school houses.

Professor Dodge's new residence at Argyle Park, Ill., is to be heated with one of the United States Heater Company's Hecla boilers.

T. C. Boyd, 42 Dearborn street, Chicago, is to move his plumbing establishment to the store and basement 38 of same street.

The Wells & Newton Company, 274 Dearborn street, Chicago, have the contract for the steam heating and plumbing in the residence of A. P. Brink, 1764 Sheridan Drive.

Peck Bros. & Company, 259 Wabash avenue, Chicago, are to furnish their plumbing specialties for the flat building of David Roberts, 202 South Clinton street, and for the residence of C. E. Gifford, 4637 Drexel Boulevard. P. Sanders & Son, 1314 Wabash avenue, do the plumbing.

The Board of Education of Salt Lake City, Utah, recently adopted a resolution authorizing the Building Committee to close a contract of $5725 with Heerch, Davis & Co., for a heating and ventilating plant in the Oquirra school.

Proposals will be received up to April 5 for heating the Primary School building at West Roxbury, Mass., and the Grammar School building at Dorchester.

The Fowler Radiator Company, 435 North Broad street, Philadelphia, Pa., have received a contract for radiators for the North Carolina School for Deaf and Dumb, calling for 10,000 feet of radiation, most of it being the Fowler semi-direct. The Brewster Hardware Company, Raleigh, N. C., are the contractors. The same firm have also recently shipped a carload of the direct and semi-direct radiators for another job, for which Allen & Cram, Raleigh, N. C., are the contractors.

F. Joseph Raehn & Co., Allegheny City, Pa., have installed hot water heating plants using the boilers of the Fuller & Warren Company for the following customers: Dr. Feree's residence and conservatory, the residences of J. Schomaker, John Carren and Mrs. S. B. Jenkins, and have heated the residence, store, office and workshop of Mr. Raehn.

The S. Wilkes Mfg. Company, 113–123 Clinton street, Chicago, are to install hot water heating plants in the residences of Dr. John Strouble and E. J. Tucker, Humboldt boulevard; also in the residence of John Burns, Austin, Ill.

A. C. Hickey, 69 Clinton street, Chicago, has the contract for the steam fitting and plumbing work in the warehouses of the Chicago Dock Company, at the foot of Taylor street.

Among the contracts recently taken for steam heating by the Theo. Jacobs Company, 72–74 Market street, Chicago, can be mentioned the following: Residence of A. F. Collins, 4930 Ellis avenue, and Joseph Redford's building, 36 Cottage Grove avenue.

Architect L. G. Halberg, 119 La Salle street, Chicago, is receiving figures for the construction of a three-story apartment house on St. James place, near Clark street, to be built by C. P. Lindquist. Steam heat is to be used.

Architect J. E. O. Pridmore, 123 La Salle street, Chicago, is receiving bids for the construction of the church to be built by the Seven-Day Adventists, at Forty-sixth street, near Wabash avenue. The building is to have a high pitched roof of slate and will be warmed by a furnace.

Architects Brompton & Lawson, Chicago, have designed for Homer C. Gross a store and apartment building, to be erected at Colorado and Albany avenues. It will be heated by steam.

Architects Murphy & Camp, Chicago, have prepared plans for an apartment house to be erected at 3641–3643 State street, to be five stories and basement high. The front will be constructed of pressed brick and copper.

F. Richter & Son, 382 to 400 Sixth street, Milwaukee, Wis., have been awarded the contract for heating and ventilating with fan system the Fifth Ward School House in that city for $7190; also the Sixth and Fourth Ward engine houses by steam, with the Richter boilers, for $530 and $430, respectively.

A decree has just been handed down by the United States Circuit Court of Appeals, Second Circuit, Judge Lacombe, in the appeal from the decision of the Circuit Court in the suit against James P. Allen for infringement of the Saunders patent dated January 31, 1882. The defense was assumed by the Armstrong Mfg. Company, Bridgeport, Conn., employers of James P. Allen. The decision of the Court of Appeals affirms the decree of the Circuit Court, which dismissed the complainant's bill.

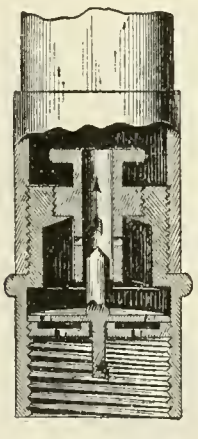
PLUMBING and GAS FITTING.

Lead Burning Class.

The progress made by the pupils in the lead burning class at the New York Trade School this year far surpasses that of any previous year. Nearly 40 pupils have qualified as excellent workmen under the system of teaching adopted by Instructor Thomas Walmsley. As a result another class has been formed from the members of the day plumbing class, and their instruction will begin April 2, to last one week. The skill acquired by the class during the term was gained in six lessons and some of the work that has been turned out has been of the most difficult character, and its appearance would be creditable to an expert. Among the work is a bottle trap with the vent attached that looks as if it was cast, a lead lined tank with all of the seams burned and waste pipe with a burned joint that has been made into a sharp quarter bend. This last operation gives a correct idea of the strength of a properly burned joint. The work that these young men have done with so short an experience reflects great credit to Instructor Walmsley as a teacher and conveys the impression that there is more mystery than difficulty in the art of lead burning. Some of the pupils are using their spare moments in making their own lead burning apparatus, the seams in the lead tanks requiring to be lead burned to stand the acids.

Economist Gas Governor.

The illustration herewith shows the Economist gas governor, patented February 6, 1894, by the New York Gas



Economist Gas Governor.

Saving Company, Decker Building, Union Square, New York, who are the manufacturers. It is a simple device intended for use in connection with ordinary gas burners to maintain an even consumption of gas and a steady flame under any pressure of gas. It may be used on any fixture and the old burner screwed on it. The illustration is more than twice the size of the actual governor, so that its construction and operation may be readily understood. It consists of a cylinder with a fixed diaphragm, a floating diaphragm and a hollow regulating screw. Both diaphragms are perforated, and an excessive pressure raises the float, which is guided by pins, until the projecting sides of the upper chamber partly cover the perforations, reducing the quantity of gas that can pass. At the same time the pin on the upper side of the float rises in the hollow screw to reduce the quantity of gas that can enter the opening in the side of it. When the hollow screw is properly set only a sufficient quantity of gas can pass through it to the burner to give a steady flame and the irregular, shooting flames due to an excess of pressure are avoided. The use of a burner that is rated 1 foot per hour less than the governor is set for is recommended so as to get a proper spread of flame. The company furnish instructions for setting and regulating the governors and have a duplicate contract by which they may be tested for one month without cost if they do not show a saving of 10 per cent.

TRAPS AND VENTS.

THE VACANCY in the Executive Committee of the National Association of Master Plumbers, caused by the death of James G. Weldon, has been filled by the election of J. J. Kennedy of Pittsburgh, Pa.

FROM PRESIDENT DANIEL G. FINNERTY of the National Association of Master Plumbers we learn that the differences existing between the association and the firm of J. Register & Sons of Baltimore, Md., have been satisfactorily adjusted.

ARTHUR SHEA, Rockland, Maine, has been improving the interior of his plumbing establishment and now has one of the finest offices on Main street.

JUDGE JAMES KEITH of the Circuit Court of Alexandria has granted a charter of incorporation to the United States Sanitary Company of Washington, who propose to do a general sanitary company business. Their capital stock is fixed at $50,000, divided into shares of $100 each. The officers are as follows: Benjamin Clark, Washington, D. C., president; J. W. Bartlett, secretary, and J. B. Kendall, treasurer. The above officers, with O. D. Bartlett of Washington and J. W. Taylor of Herndon, constitute the Board of Directors.

THE MASTER PLUMBERS' ASSOCIATION of Malden, Mass., recently met in the Theosophical rooms and listened to an address from National President Daniel G. Finnerty of Boston.

THE PLUMBING FIRM of Cannon & Paul at 219 Congress avenue, New Haven, Conn., have dissolved, the senior member withdrawing. Mr. Cannon will open a new establisment at 225 Congress avenue.

EDWARD ARMIT has purchased the stock of plumbers' material of H. C. Malo of Hohman street, Hammond, Ind. Mr. Malo has accepted a position with an Indianapolis house.

AN ORDINANCE has been adopted by the Atlanta, Ga., City Council providing for the examination and licensing of plumbers.

D. S. DUNAVAN will remove his plumbing business April 1 from Park avenue to East Front street, Plainfield, N. J.

SANDS & HOULE, who are about to open a plumbing shop in Biddeford, Maine, recently spent some time in Boston purchasing stock.

WM. GRITZMAHER is about to open a plumbing and steam fitting shop at Jamestown, S. D.

SUNKEL & HECKMAN have bought the Y. M. C. A. building at Zanesville, Ohio, and will use it as a plumbing establishment.

THE BROOKLYN HOUSE of the Henry McShane Mfg. Company, at 50 and 52 Myrtle avenue, have a line of plumbers' goods that comprises everything required for a modern system of plumbing, and are having demands made upon it as the season begins to open.

THROUGH the failure of the authorities of Leominster, Mass., to comply with the State plumbing law, the plumbers of that city are in a peculiar dilemma. Plumbers from surrounding towns can come there and do all the work they can get, but Leominster plumbers, not having been examined, licensed and registered according to law, cannot work in the outside towns.

WILLIAM S. COSTA, formerly foreman for L. C. Yaeger, Tallahassee, Fla., together with John M. Chase from New York, have begun business under the firm name of Costa & Chase, as plumbers, tinners, gas and steam fitters and roofers, at Tallahassee, Fla.

"JUST A FEW WORDS" is the title of a pretty catalogue sent out by the Toronto Steel Clad Bath & Metal Company, Limited, relating to the steel clad baths. The few words are addressed to architects and touch upon the excellences of the steel clad bath.

THE MASTER PLUMBERS' ASSOCIATION of Passaic County, N. J., with headquarters at Paterson and a membership of 37, have affiliated with the National Association of Master Plumbers.

C. H. REVERCOMB has purchased the plumbing and steam fitting business of W. H. Smith, Winnipeg, Man.

DUNCAN MCTAVISH has purchased the gas fitting and plumbing establishment of Geo. McLane, at Racine, Wis.

THE FIRM of Ryan & Surrell, plumbers, composed of Oscar Ryan and Howard Surrell, have just opened a shop at Fort Wayne, Ind.

"PLUMBING, OLD AND NEW," is the title of a 16-page pamphlet being sent to prospective customers by Boyd & Schnaier, 347 Columbus avenue, New York. The pamphlet has a yellow cover with a scroll design, into which a cluster of tools is worked. It is illustrated with half tone engravings of old and new work and also shows a corner of their sample rooms. Two pages are specially devoted to explaining the

character of their work, and it is mentioned that they import sanitary earthenware. The testing of plumbing work with a sanitary smoke machine is made a specialty.

THE Detroit, Mich., board of plumbing examiners, J. Meathe, H. McDonald and S. Dickson, will meet hereafter every Friday evening to examine applicants for licenses as master or journeymen plumbers. In Detroit there are about 165 master plumbers and 250 journeymen. Of this number but 215 have registered.

THE BOARD OF EXAMINERS for plumbers' licenses at West Newton, Mass., consists of Dr. F. G. Curtis, Geo. H. Elder and W. H. French. It has organized with Dr. Curtis as chairman and Mr. Brimblecom as clerk, and will hold examinations for applicants for licenses on the last Wednesday of each month.

AN ORDINANCE has been passed by the Council of Aurora, Ill., providing for an inspector of buildings and plumbing, to be appointed May 1.

HUGH MCCOLLUM, a plumber, of Cincinnati, Ohio, recently died at the age of 62 years. He was a man of superior executive ability and rendered excellent service to the Ohio Mechanics' Institute, of which he was a director and treasurer for more than 20 years. He was also an active worker in the Cincinnati Industrial Expositions.

DR. W. H. SHAFLER, North Manchester, Ind., and J. W. Domer will open up a plumbing establishment there this spring.

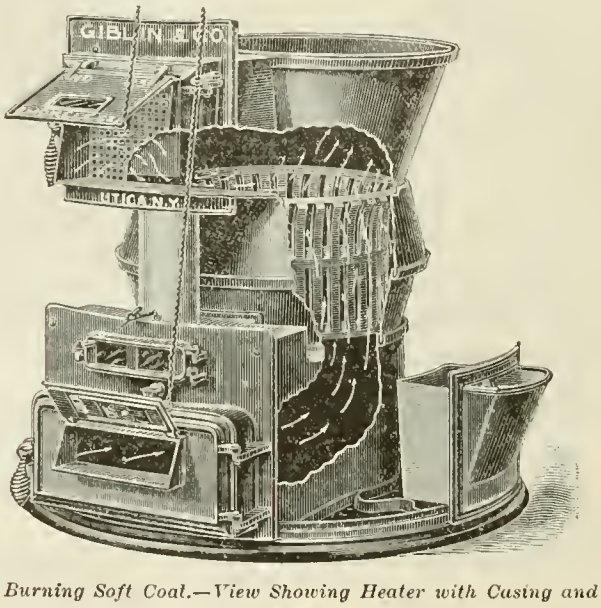
THE FIRM of Dunbar & LaChapelle, plumbers, have been dissolved and the business will be continued by Alexander P. LaChapelle at 178 High street, West Medford, Mass.

A FIRE at Pawtucket, R. I., damaged the plumbing establishment of Taylor & Co. to the extent of $5000; covered by insurance.

PLUMBER J. J. HOULIHAN has removed to one of the basement stores in the Whipple Freeman Block, Brockton, Mass.

Furnace for Burning Soft Coal.

A furnace which is said to be so constructed as to successfully burn soft coal as a fuel has recently been introduced to the trade by Giblin & Co. of Utica, N. Y. It represents the results of careful investigation and experience in connection with the use of the fuel named, and aside from the soft coal apparatus is like the company's well-known Standard furnace. One of the special features incorporated in this heater is the sectional fire pot, in which the coal is held suspended in such a way that it is surrounded at the sides and bottom by the air passing through the ash pit, allowing all parts of the fire to be reached by the air for the purpose of promoting combustion. The engraving which we present herewith is a view of the furnace with the casing and radiators removed, while a portion of the side is broken away, showing the position of the fire pot and the course of the air currents entering through the combination door and ash pit. The combination door is so devised as to admit just the quantity of air required by the fire in order to insure the best results. When the door is lifted the air is admitted through perforations, and striking the solid plate back of the perforated one, causes the air to travel in a downward direction, becoming heated in its progress and finally enters the combustion chamber. This air while warm is yet cooler than the air in the combustion chamber, which causes it to take a course along the bottom of the mouthpiece until it meets the ascending gases and is drawn in and united with them. The makers state that by the use of this combination door and sectional fire pot the fuel is suspended in a body of warm air, and whatever oxygen is required for combustion is drawn from it. It is also stated that the parts of the soft coal burning apparatus can be removed and replaced through the feed door without disturbing the other parts of the heater. In this apparatus, it is claimed, there are no joints in the hot air chamber through which gas and smoke may escape. Reference is made to the durability of the fire pot, and to the fact that the four-dome radiator, which rests directly upon the section of the heater shown in the engraving, is made in one casting without any joints, its peculiar construction giving practically a vertical interior surface. By this arrangement, it is pointed out, dust, soot and ashes have no place to rest and must necessarily fall back into the fire pot, making the furnace practically self cleaning. The manufacturers refer to the large smoke outlet as providing ample draft, and say that the proportions of the furnace are such as to give satisfactory results in operation.



Furnace for Burning Soft Coal.—View Showing Heater with Casing and Radiator Removed.

SCRAP.

GEORGE W. JAQUES, late a member of the tin plate and metal firm of A. A. Thomson & Co., New York, has embarked in business for himself as a manufacturer of American tin and terne plates. Mr. Jaques is widely known in the trade, with which he has had a connection of 30 years' standing, and is thoroughly acquainted with the manufacture of tin plates. The Jaques tinning machine, of which an illustrated description was recently given in *The Metal Worker*, was designed and patented by him; and it is this machine that is being operated in Mr. Jaques' new works. These works are on Thirteenth avenue between Twentieth and Twenty-first streets, New York City. They are well situated and equipped with all the most modern facilities for the production of high grade plates. Two pots are at present installed and at work, having started up last week. Two more will shortly be added. The first output was composed of bright plates, specimens of which were submitted to the leading tin plate houses of the city, eliciting their warm commendation. The Jaques tinning pots, which were put in practical operation here for the first time, have been found to work entirely satisfactorily. Mr. Jaques is a firm believer in the future of the American tin plate industry, tariff or no tariff, and has made preparations for a long tenancy of his present quarters.

ONE of the largest cab companies in Paris is using tin plate for the bodies of the vehicles. Experiments are now being made with aluminum for this purpose, in order to still further decrease the weight.

THE UNITED STATES IRON & TIN PLATE MFG. COMPANY, Demmler, Pa., have recently placed a contract for a second Mesta patent pickling machine with the Leechburg Foundry & Machine Company of Pittsburgh. The first Mesta machine in operation at the above plant has been running for about two years, and has been pickling from 40 to 45 tons of sheets per day. The Leechburg Foundry & Machine Company have received orders for three of these machines during the last two weeks.

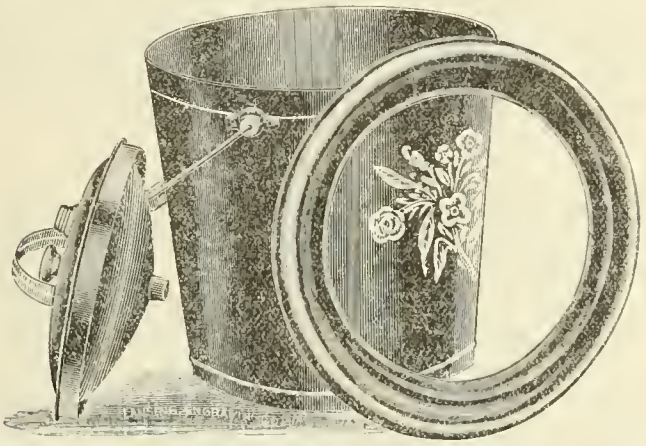
THE FALLING OFF in the consumption of pig tin in the United States during the last few months has been quite remarkable. The total consumption is calculated at 2400 tons since January 1, as compared with 4300 tons in the corresponding period of 1893. The reserve stock in hand is also extraordinarily low, being less than 1200 tons in New York, Boston and Philadelphia, of which about 1000 tons are held in bond.

MERRY & CLARK, successors to John Merry & Co., 535-547 West Fifteenth street, New York, mention that their special heavily coated brand of roofing plates—Merry's Old Method—is meeting with great approval from the trade. As an illustration of the sterling quality of these plates, it is stated that a roof covered with them was put on in Harlem in August of last year and remained unprotected by paint until a week or two ago. The plates were found to have stood the trying winter weather remarkably well. They had not rusted, and in every respect remained in a perfectly sound condition.

THE RETAIL STORE.

Commode Deodorizer and Slop Jar.

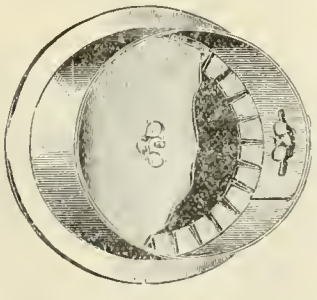
The Folding Bath Tub Company, Marshall, Mich., are putting on the market a combination commode deodorizer and slop jar, an illustration of which is shown in the accompanying engraving, which shows the separate parts of the commode, it having the appearance of a slop jar when the parts are placed together. It is an article specially intended for hospitals and sick-rooms, and particular emphasis is laid upon the fact that it is an instant deodorizer. The body and seat are made of flax fiber, the cover being of metal, having a hollow chamber which contains the deodorizer, and by opening a valve a portion of the disinfectant is allowed to pass into the body of the commode. When not in use as a commode it takes the place of a slop jar, being described as light, durable and non-adhesive and easily cleaned.



Separate Parts of Commode and Slop Jar.

Adjustable Flue Stop.

The accompanying illustration shows an adjustable flue stop that is manufactured by Foster & Keach, Table Grove, Ill. The stop can be made to fit any pipe opening; and when adjusted cannot, it is claimed, become loose or be blown out. It further provides a double protection against smoke and soot, and the inner plate protects the outer part from becoming heated and thereby defaced. The stop is described as substantially made and firm in position after adjustment.



Adjustable Flue Stop.

Fifty Years a Merchant.

On March 1 William H. Barlow, Hardware merchant, of Sing Sing, N. Y., completed the fiftieth year of his connection with that business. To signalize the event Mr. Barlow gave a supper in the evening to his employees and a few invited guests. On behalf of the employees Mr. Barlow was presented with an elegant gold headed ebony cane, his initials being engraved on the handle. During the evening Mr. Barlow made an interesting address, in the course of which he narrated the history of the business. From this address we take pleasure in making the following extracts:

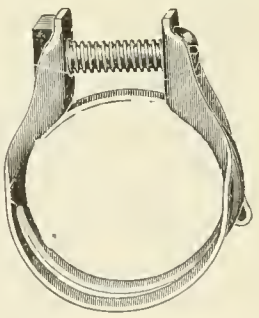
One man in the shop was able to make all the Tinware sold and do all the work outside, with the help of a boy. I went in the shop to learn the trade, but I was the boy of all work. I opened and closed the store, was clerk, helper in the shop and stove blacker. For four years I did this kind of work for the munificent salary of $30 a year and board. In 1852 I bought out Mr. Jarvis' interest, when the firm became J. Barlow & Son.

What a difference in the trade today in this place compared to 50 years ago! Then two tin shops with one man each were able to do all the work and make all the Tinware sold. There was no machinery used for making Tinware at that time. Now we have in this place seven tin shops. There was no plumbing, gas or steam fitting done then, as there was no one competent to do it, and there were no hot air heaters used; mostly wood Stoves were in use. Now we have men competent to do any kind of heater or tin work, also plumbing and steam fitting.

What a change in the Hardware trade since 1844! Then all the Hardware sold was imported, excepting Cut Nails; all Wrought and Horseshoe Nails were imported. All the wholesale Hardware stores in New York City were below Wall street, in Pearl. The first American Hardware I remember being made in this country was Door Locks, which were made in the prison here. All the Carpenters' Tools used were of foreign make, now the United States send immense quantities of Hardware to England, and in Saws and Edge Tools we can beat the world.

Sherman's Hose Clamp.

H. B. Sherman, Battle Creek, Mich., is offering an improved hose clamp, as herewith shown. It is stamped in one piece from sheet brass. The strip that is cut out from the lower part of the band is turned up under the screw to give an even grip. The manufacturer claims that the band remains always tight upon the hose; that it will not rust; that it is strong; that it can be easily taken off, and that it is as cheap as a wire band. The clamp is made in ½, ¾ and 1 inch sizes.



Sherman's Hose Clamp.

MEMORANDA.

W. T. Hoffman & Co., who began business in 1883 with a small tin shop, have been gradually enlarging their premises until they occupy two stories of a building 38 x 70 feet, they having lately doubled their facilities. They carry a full line of hardware, stoves and ranges, glass, paints, oils, varnishes and house furnishing goods. Their building, which they occupy, was built in 1888 of stone and brick.

We learn from George Rome & Co., Mansfield, Chartiers P. O., Pa., that their town name has been changed to Carnegie, to which address all mail matter should hereafter be sent.

William I. Davenport, son of the late William Davenport, died March 21 at Albany, N. Y., aged 30 years. His father conducted a stove store on North Broadway for many years and was succeeded by his son, who carried on the business with success up to within a short time of his death. The deceased was a director of the Albany Stove Company, and at one time treasurer of the Commercial Union Co-Operative Bank. He also held the position of financial secretary of the Catholic Union.

John G. McBride, about April 15, will open business at Missoula, Mon., with a complete line of stoves, tinware, house furnishing goods and plumbing. He requests dealers to send him catalogues in these lines.

STEAM AND HOT WATER.

Connecting Two or More Boilers Together.

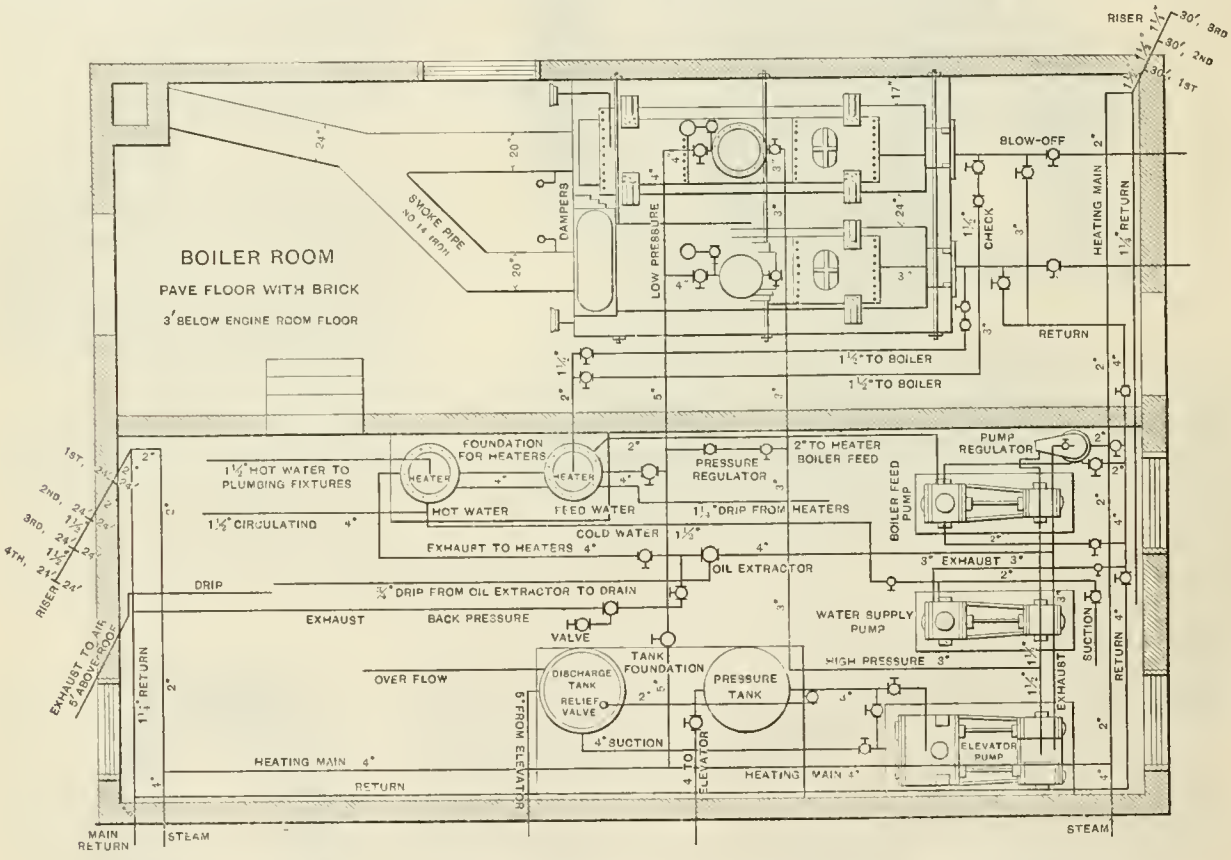
BY HELIOS.

The steam fitter is often called upon in erecting large steam plants, where there are two or more boilers used, to manage the piping so that one or any number of boilers can be used at a time to warm the building. In setting the boilers the water line must be at one level for all the boilers if they are to work on the return gravity system. The steam connections must be taken from the highest part of the boiler and connect into a large main steam pipe. The return pipe to the boilers must be large and connect into one large return main.

For an example of the size of pipe necessary I will give the size to use on a pair of boilers having 36-inch diameter grates. From each boiler connect a 4 inch steam pipe into a 5 inch main steam pipe, and connect a 3-inch return pipe from each boiler into a 4-inch main return pipe. Place angle or gate valves in the steam and return pipes, to shut when the boiler is not in operation. Do not place check valves in the return pipes. With connections made like the above explanation there will be no trouble in the working of the apparatus; the water line will always stand at the same level in the boilers, and it will keep at the same level if there is a very strong fire in one boiler and a very light one in the other. If the main steam and return connecting pipes are large enough the pressure in the boilers will equalize and the water will stand at one hight in both boilers. Boilers of any size or any number can be connected together as the above connections are made and will work perfectly if the pipe connections are of the right size to equalize the pressure on all the boilers.

High and Low Pressure Boiler Connections.

In a building that is warmed by steam having a large amount of radiation, which will require two or more boilers to do the heating, and high pressure is also used for power, the boilers can be connected together so that all of them can be run on low pressure or any of them on high pressure. Take a pipe from the top of each boiler and place a tee on the end, the openings looking from the front to the rear; place a valve on each side of the tee. Connect from the valves on the rear into a large steam main for low pressure, and from the valves in front into a steam main for high pressure. Make all the connections to the boilers as if they were only to be used for low pressure, as explained in previous articles (connecting two or more boilers together), only place a tee in the return connection to the boilers between the valve and the boiler for pump connection when the boiler is used for high pressure. Connect the high and low pressure steam pipes together and place in this connection a pressure reducing valve, so that if any of the boilers are used for high pressure the boiler can be worked to its full power, and all steam not used for power can be used for heating. All the exhaust steam from the engine or other power can be used to warm the building by connecting the exhaust to the low pressure main. Place in the exhaust pipe from the engine an oil extractor to remove all the cylinder oil from the exhaust steam. For supplying water to the high pressure boiler, place a steam pump and connect the suction to the main steam pipe. Run the discharge pipe from pump and connect into the tee in return pipe to the boiler. Place in the water supply pipe at boiler a check and valve. The exhaust from the pump can be connected into the exhaust pipe from the engine. By this arrangement any of the boilers can be used for high or low pressure and all of the exhaust steam can be used for heating.



Connecting Two or More Boilers Together.—Fig. 1.—Plan of Boiler and Engine Room for a Hotel.

Plan of Boiler and Engine Room for a Hotel.

The plant shown in the illustration is one that has been erected in a large hotel in the South. It shows high and low pressure boiler connections and exhaust steam connections, also low pressure steam heating. Two 50 horse-power return flue tubular boilers were used for the heating and power. High pressure steam was supplied to a duplex

steam pump to operate the elevator, a single acting steam pump for the water supply of the building and a single acting steam pump for feeding the boilers. The boilers are connected up so that any one can be run on high or low pressure, or they can be run on high or low pressure together. When one boiler is used on high pressure the exhaust is used to warm the building, with steam direct from the boiler to supply all the steam necessary for the heating if there is not enough exhaust steam. In cold weather the two boilers are run on high pressure from 6 a.m. to 12 p.m., and all through the night they are used on low pressure. When used on high pressure the condensation is returned by a steam pump. When on low pressure the condensation returns by gravity. All the exhaust steam passes through two feed water heaters; one for supplying hot water to the kitchen, laundry and plumbing fixtures, the other for heating the feed water for the boilers. Fig. 2 shows heater connections. All drips from heaters and exhaust pipes are carried back into the main return pipe from radiation and connected into the return between the boiler and valve in main return. Fig. 1 shows all steam, water, drip and return connections, also elevator connections to pressure tank, from pressure tank to elevator, and discnarge from elevator to discharge tank, also from discharge tank to pump.

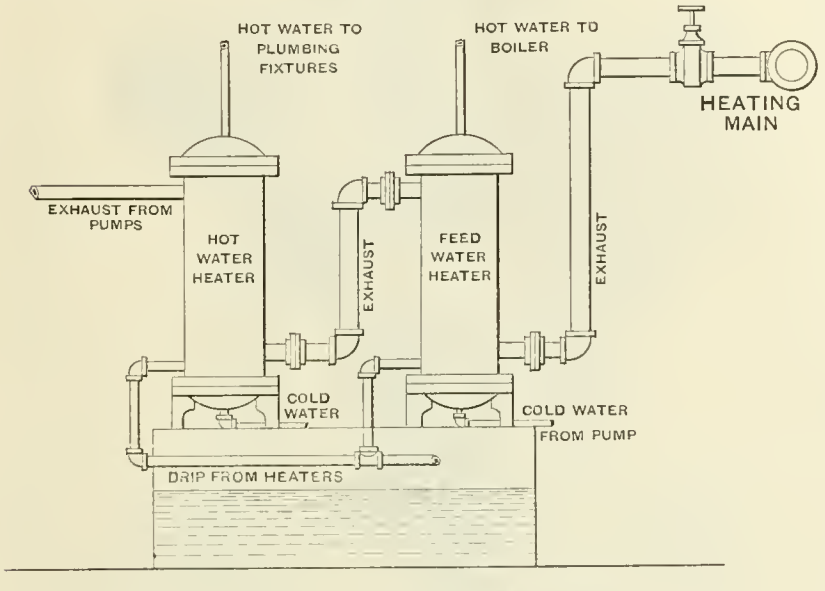


Fig. 2.—Elevations of Heater Connections.

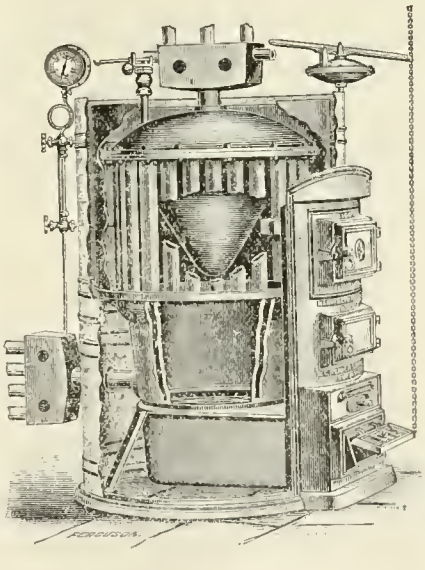
Location of Expansion Tank.

From M. K., *Bound Brook, N. J.*— A discussion of the following questions in *The Metal Worker* would be interesting to many of its readers. Should the expansion tank be placed on the flow or return pipe in a hot water heating system? Why is the expansion tank usually placed on the return?

Note.—Here is an invitation for our readers to give their opinions on expansion tanks. It is claimed by some that the expansion tank should be placed on the return and preferably at the boiler. Where a distant radiator is near the highest point the expansion tank is by some connected with the return from the radiator. It has been said that when the expansion tank is placed on the flow pipe it is not only filled with hot water and considerable heat lost, but under heavy firing at the boiler it overflowa and sometimes the water is blown out by the steam. The same authorities claim that when connected with the return this is prevented and that the heat which would be lost is utilized. Others claim that when connected with the return it is necessary to run a small pipe from the flow main to the expansion tank, if located in a cold place, to keep up a circulation and prevent it from freezing. These opinions from various authorities may call up corroborative experience from our readers.

The Henderson Steam or Hot Water Heating Boiler.

In the accompanying illustration we present a broken view of a steam boiler for house heating purposes made by J. C. Henderson, Troy, N. Y. The same boiler is also adapted to heating with hot water. The boiler, it will be noticed, consists of an annular water space forming the fire pot, of cast iron, also another water space made in a conical shape, likewise of cast iron, and supported above the fire. Between these two sections is a circular row of 2 inch wrought iron tubes expanded into the fire pot section and the cast boiler above. Particular attention is directed to the way the surface is arranged as giving exceptionally efficient service. The flames and hot gases impinge on the conical surface, and at the same time vertical circulation is provided for by means of the connecting tubes. From the top of the boiler the flow is taken, while the return is carried to the header and from thence into the bottom of the fire pot section. The boilers are made in five sizes, the fire pot in the smallest sizes being 14 inches deep, and in the larger sizes 22 inches deep. A special point is made of the deep fire pots, the manufacturer stating that they will maintain a more steady and uniform fire with less care and attention. The boilers have dumping and shaking grate, and are incased as shown in the cut.



Broken View of Henderson Steam Boiler.

HEATING NOTES.

C. S. Graves, who is well known to the steam and hot water trade in the vicinity of New York, is now one of the representatives of the American Boiler Company, 94 Centre street, New York.

Phillips, Doup & Co., Pearl and water streets, Brooklyn, have had a steady trade in their steam heating boilers, and report that general satisfaction has followed their installation wherever used.

John A. Scollay, 74 and 76 Myrtle avenue, Brooklyn, has remodeled his construction plant for the erection of heating apparatus and put in a line of pipe cutting machinery, run by power, and is abreast of the times with this capacity to handle large contracts readily. The advance was necessary to properly meet the requirements of the growth of business in manufacturing and selling the Scollay hot water heaters.

The James W. Birkett Mfg. Company, 51 and 53 Jay street, Brooklyn, find a combination of steam and hot air popular with their trade and have used the Economy heaters in a number of contracts.

Barber & Ross, Eleventh and G streets, N. W., Washington, D. C., have added a hot water and steam heating department to their business and have engaged W. H. Pennell, well-known to the trade, as superintendent of the new department, which will have a corps of competent workmen under his direction.

The United States Heater Company, Detroit, Mich., issue circulars relating to their well-known Hecla steam heater. One small circular shows a general view of the heater, with table of sizes and some few important particulars. A larger circular gives fuller information, together with several illustrations.

Major H. E. Light, who has been assisting the Eureka Heating and Ventilating Company of Saginaw, Mich., in installing some large plants, is making a visit in the East before entering the spring and summer campaign.

In *The Metal Worker* of March 17, page 35, we referred to the fact that the Pittsburgh Heating Supply Com-

pany's business at Greensburg and McKeesport, Pa., had been purchased by H. Clymer Painter and S. J. Sloan, who will continue the business at the former place under the name of Painter & Sloan, and at McKeesport as Sloan & Painter. We made a mistake in referring to the business of the new firm, who will be engaged as dealers and contractors for hot water, steam and hot air apparatus, tile work of all kinds, &c.

Vice president A. T. Henderson of the United States Heater Company, manufacturers of Capitol, Hecla and Mascot heaters, Detroit, Mich., was in New York last week looking for a location for a branch office. Mr. Henderson wishes to arrange for desk and sample room in connection with some other concern, preferably in the plumbing supply business, or with some dealer in fittings in the Centre street district. Mr. Henderson will be glad to hear from any one having space to rent for this purpose in the neighborhood mentioned.

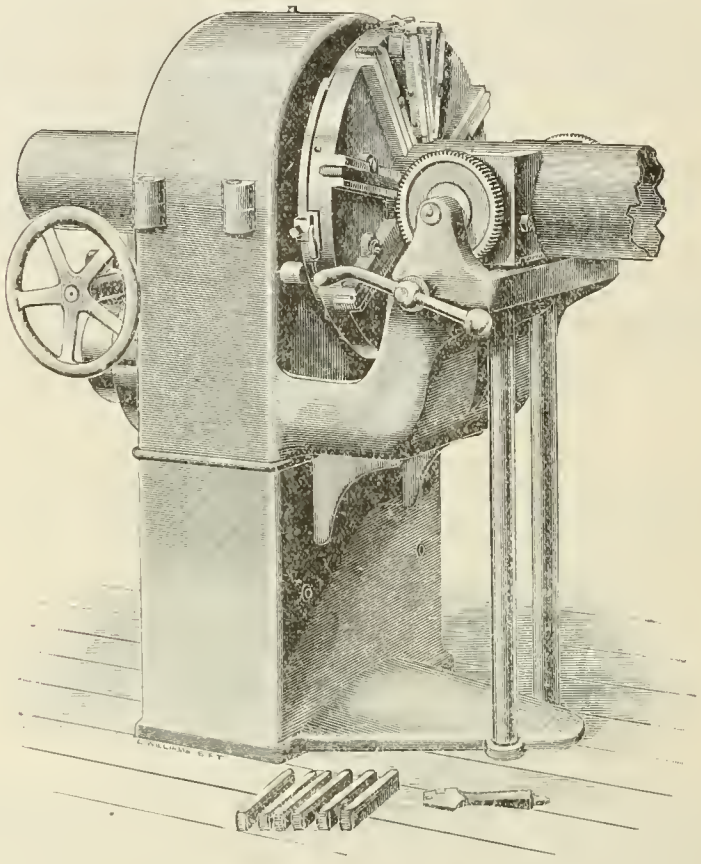
C. M. Wolley, secretary of the American Radiator Company, took passage March 21 on the steamer "Majestic" for a two months' trip to Europe.

A. E. Appleyard, Boston, Mass., is the patentee of an electric heating apparatus, one half interest in which is assigned to H. F. Folsom. The invention relates to an apparatus adapted for heating water with a view to making it circulate through radiators and the usual piping system.

We are in receipt of some neat little pamphlets from the Richmond Stove Company, Norwich, Conn., descriptive of their well-known line of steam and hot water heaters. These pamphlets, bound in colored paper, are issued in the names of different dealers handling the Richmond heaters. One of them, descriptive of the Rex heater, carries the name of L. M. Rumsey Mfg. Company, 810 North Second street, St. Louis, Mo.; another, referring to the Richmond heaters, is issued in the interests of W. R. Park & Son, 19 Court street, Taunton, Mass.; a third Richmond heater catalogue carries the name of Canfield Stove Company, Rondout, N.Y.; while a fourth pamphlet relating to the Richmond boilers has on the front cover the name of Edward E. Parker, 8 Middle street, Woburn, Mass. All of these pamphlets describe the heaters mentioned with neat illustrations and table of sizes, and in addition there are several pages of testimonial letters at the end of each pamphlet, the letters coming from persons in the district of the firm whose name appears on the cover. The Richmond Stove Company issue similar pamphlets to the firms handling their goods when the latter furnish them with testimonial letters for publication.

Threading and Cutting Off Machine.

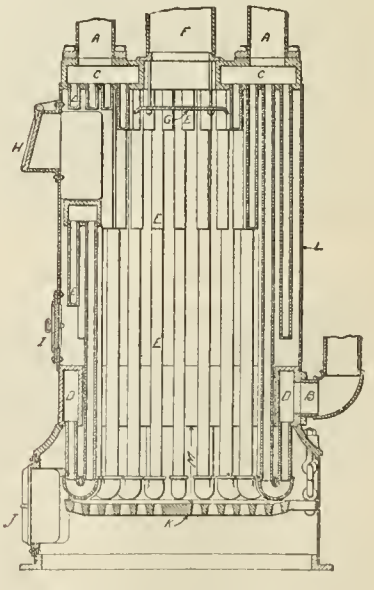
The illustration herewith shows a pipe threading and cutting off machine made by the Armstrong Mfg. Company, Bridgeport, Conn., with New York office at 139 Centre street. The merit of the machine, it is said, has been developed by experiment, and it possesses the advantages of both simplicity and compactness. It is made in several styles and sizes, adapted for either hand or power, and adjustable to variations in fittings. The machines are made to cut off and thread pipe from 1 to 6 inches in diameter, and are arranged for the pipe to be taken from them without removing the dies by a simple movement which effects an important saving of time and labor. All of the gears and working parts are incased in an oil chamber, which keeps the bearings lubricated and prevents the entrance of iron chips or dirt. From two and a half to four minutes are occupied in threading a pipe, according to its size. The No. 1½ machine, which works pipe up to 4 inches, weighs about 700 pounds, and has a countershaft speed when used with power of 325 revolutions. The No. 3 machine works 6-inch pipe and weighs 1200 pounds. The cutting and threading tools are made of the best material and are interchangeable. The machines are always fitted with right hand dies unless otherwise ordered, when dies for cutting left threads can be furnished. The large machine can be operated by hand power when desired, the speed depending on the activity of the man at the crank.



Threading and Cutting Off Machine.

The Windsor Hot Water Heater.

The Windsor Heater Company, Galena, Ill., manufacture the Windsor hot water heater, a sectional view of which is shown in the accompanying engraving. The heating surface, it will be noted, consists of an upper chamber and a lower water ring, connected by pipes with return bends immediately above the grate. This gives a very extended and efficient fire surface. The manufacturers point out particularly the fact that every joint is made iron to iron without packing or bolts. The boiler is surrounded by a substantial steel sheel which can be easily removed. The return water enters the lower annular water space, whence it is distributed around the heater and then conveyed through a large number of vertical pipes to the upper water space, all the time in contact with the fire. The heaters are made for burning hard or soft coal and will, it is claimed, burn any kind of fuel commonly used for heating purposes. The surfaces being vertical, it is mentioned that cleaning is not needed, except the ash pit, which is very large and deep. The Windsor heaters are made in ten sizes with outside diameter from 22 to 42 inches; fire pot 13 to 30 inches diameter, adapted to supply from 300 to 3300 square feet of radiation.



Sectional View of Windsor Hot Water Heater.

STOVE TRADE NOTES.

National Association of Stove Manufacturers.

The following announcement has been issued under date of March 24 from the office of Secretary D. M. Thomas:

The twenty-third annual meeting of the above association will be held at the Auditorium Hotel, Chicago, on Wednesday, May 2 next, at 10.30 a.m. Arrangements have been made with the hotel managers for a rebate of 50 cents per day from their usual charges for rooms with meals, which are from $4 per day upward. Rooms without meals may be had at the usual rates of $2 per day and upward. Accommodations can be reserved by application to the manager, stating requirements. It is designed that the discussion of subjects connected with the production of stoves shall be a prominent feature of this meeting, and the president earnestly desires that every stove foundry manager will be in attendance, as well as those gentlemen connected with the distributive department who are usually present.

The preparation of certain papers has been arranged for, among which are the following:

The Principles of Design as Applied to the Ornamentation of Cast Iron, with Especial Reference to Stoves.

Pattern Construction, Including Follow Boarding.

Foundry Management.

The Relations Between Employer and Employed.

The Stove Business of the European Continent.

The Education and Production of Efficient Workmen.

Cleaning Castings.

Can Profit Sharing with Employees be Used to Advantage by Stove Manufacturers?

The Advantages or Disadvantages of Interchange of Information and Experience Between Stove Manufacturers.

It is believed that they will contain valuable information and the comments following them be most instructive. Other papers are requested—indeed, contributions upon any of the various operations of a stove foundry will be welcome. It has been customary to invite to our annual meeting stove manufacturers who are not members of the association. A similar invitation is now extended, and the president cordially requests every firm receiving this notice to be with us and take part in the discussion of such subjects as are of general interest and to present their views upon topics connected with the production of stoves by means of original papers or essays. Those not officers of corporations nor members of firms should furnish credentials from their principals addressed to me. Firms who expect to be represented will kindly fill out and return the inclosed blank.

Secretary Thomas has also issued under the same date a letter to the effect that the ninth annual meeting of the Stove Founders' National Defense Association will be held at the Auditorium Hotel, Chicago, on Tuesday afternoon, May 1 next, at 2 o'clock sharp.

Cupola Management.*—IX.

BY DR. EDWARD KIRK.

Bod Sticks.

Two kinds of bod sticks are used for stopping in a cupola. They are the wood stick and the combination wood and iron stick. The wood sticks are made eight square or round from 1½ to 2 inches diameter and from 5 to 10 feet long. They are made of both hard and soft wood and about an equal number made of each wood, as some prefer one and some the other. When stopping in the stick is held against the bod in the tap hole until it sets in the hole and the stick generally takes fire from the heat of the spout. On this account they soon become small near the ends and have to be sawed off; for this reason they are always made longer than necessary and sometimes larger in diameter.

The combination stick is made of the same diameter as the wood stick, and from 4 to 10 feet long. An iron ring is placed on one end of the stick, and a rod of round iron of from ½ to ⅝ inch diameter and 1 to 3 feet long is placed in the end of the stick. On the end of the rod is placed a round button of from 1½ to 2 inches diameter, for carrying the bod. The object of the rod is to prevent the stick being burned by the heat of the spout every time the cupola is stopped in, and the length of the rod is made to correspond to the length of the spout. The objection to the combination stick is that the button does not carry the bod as well as the wood stick, and the button and rod must be wet every time it is used to keep it cool, or the heat would dry out the bod and it would fall off. This repeated wetting rusts the button, and if the edges come in contact with the molten iron it makes the iron sparkle and fly, and for this reason most founders prefer the wood sticks, even at the extra expense of keeping them up.

An iron rod and button without the wood stick is also used in some foundries for stopping in, but they were not used by our grandfathers and are not popular with melters. Three or four bod sticks are provided for each cupola. They are placed on end in a rack alongside of the tap bars, within easy reach of the tap hole, and a bod is kept on each stick all the time the cupola is in blast.

Bod Material.

The bod is a plug used for closing the tap hole when it is desired to stop the flow of iron from a cupola, and the material of which the bod is composed has a great deal to do with the nice working of the tap hole. When the bod is composed of fire clay, or largely of fire clay, it does not give up the water of combination rapidly, and if a tap is quickly made after stopping in the iron sputters and flies as it comes out of the hole. If the bod is permitted to become perfectly dry it bakes so hard it cannot be cut away with the hand bar, and the heavy bar and sledge have to be used to make a hole of the proper size. If a friable sand is used it crumbles easily before the bar and a nice clean hole can be made, but it does not hold well, and if the cupola is stopped in for any length of time the bod may be forced out by the pressure of metal.

Some of the loams make an excellent bod that holds well and is easily cut away with the point of the bar, and leaves a clean hole. Some of the molding sands also make good bods in their native state, and there are several materials that are peculiar to certain localities that make good bods. When a suitable material cannot be found it must be made by mixing two or more materials. A good bod is made by mixing blue or yellow clay and molding sand. When these clays cannot be procured a good bod can be made by mixing just enough fire clay with the molding sand to give it a little more adhesive property, but not enough to make it bake hard. When a large body of iron is collected in the cupola before a tap is made the bod material must be strong, and bake in the hole sufficiently hard to resist the pressure of the iron, and an entirely different material must be used for this kind of tapping than is used when the cupola is only stopped in for a few minutes at a time.

Small cupolas from which only a small hand ladle is drawn before it is stopped in also require a different bod, for the hole has hardly time to clear itself before it is stopped in again, and if the bod burns hard or sticks in the hole, the hole is so hard to open that the small amount of iron is chilled by the bar and slow tapping before it can be run out. This kind of a cupola requires a bod that will crumble and fall out as soon as touched, or burn out as soon as the hole is opened. A nice bod is made for this kind of work by mixing clay, molding sand and sawdust and making it fully half sawdust. Blacking or sea coal are also mixed with bod material to make it more porous when burned and crumble more readily when tapping.

Horse manure was at one time considered to be one of the essentials of a good bod, but it has been replaced by blacking or sawdust and is seldom used. A good bod should have strength to resist the pressure of molten iron in the cupola and at the same time break away freely before the iron and leave a clean hole. Such a material can be made suitable for any cupola, no matter how it is tapped, and a bod material should never be used that requires the sledging tap bar to open the tap hole.

Tapping and Stopping In.

When the blast is put on the tap hole is always open, and it is left open until the iron melts and flows freely and hot from the hole. This is generally in from 5 to 20 minutes after the blast is on. While the melter is waiting for the iron, he arranges his tap bars, bod

*Copyrighted, 1894, by Dr. Edward Kirk.

stuff and bod sticks and places a bod on each stick to be ready for instant use. The bod material is worked a little wetter than molding sand to make it adhere to the end of the bod stick or button, but care must be taken not to have it too wet or it will make the iron fly when stopping in, and, furthermore, the bod does not hold well when too wet. The bod is made by taking a small handful of the bod stuff and pressing it firmly on the end of the stick with the hand. The size and shape the bod is made depends upon how the iron is tapped and the size of tap hole. When the hole is small and only stopped in for a few minutes at a time a small bod stick is used and the bod made very small and shallow and only pressed into the hole a short distance, so it can be quickly broken away when tapping. When the hole is large or has to be stopped in until a large body of iron collects in the cupola, the bod is made large, long and pointed, so that it may be pressed well back into the hole and stay in place until removed with the tap bar.

The first iron melted flows from the hole in a small stream, and generally chills in the hole or spout and has to be removed with the tap bar; but it soon comes hot enough to clear the hole, which is then closed, unless the first iron is used to warm the ladles and the hole is kept open through the heat. If the work is light, a small tap is made in a few minutes to remove any iron that has been chilled and dulled by the dampness in the sand bottom. But when the work is heavy this tap is not made and the molders go on with their regular pouring from the start. The tap is made by placing the point of the bar against the bod and giving it a half forward and back rotation and at the same time pressing it into the bod, or by carrying the handle end of the bar around in a small circle and at the same time pressing it in. As soon as the bod is cut through, the bar is run into the hole once or twice and worked around a little to remove any of the bod that may be sticking around the sides of the hole. The bar must always be held in such a position as will make the hole in a line with the spout, or the stream will not flow smoothly and may shoot over the sides of the spout and burn the men catching in.

When about to stop in, the bod is placed directly over the stream close to the tap hole and the other end of the stick is elevated at a sharp angle from the spout. The hole is closed by a quick downward and forward movement of the stick that forces the bod into the hole and checks the stream at once. The stick is then held against the bod for a few seconds until the force of the stream is stopped and the heat has set the bod fast in the hole. The part of the bod that does not enter the hole is then removed with the stick to keep the spout clean, and the stick is dipped in water to cool it, and another bod applied to be ready for the next time. There is a great knack in stopping in that some melters never acquire. They hold the bod too far from the hole, and attempt to push it up, under or through the stream; they get nervous and are not sure of their aim and strike the stream too soon, or the side of the hole, and the iron sputters and flies in all directions.

The bod sticks are frequently made so long and slender or so heavy that it is impossible to accurately place the bod, and it is sometimes difficult to get the cupola stopped in with these long sticks. It is also difficult to stop in when the cupola is placed very high, for the melter cannot get up to place the bod stick at a proper angle for stopping in, and has to run the bod up through the stream in place of cutting off the stream with the bod. An arm or bracket is sometimes placed over the spout near the tap hole, when long bars and sticks are used, upon which to rest the tap bars and bod sticks when tapping and stopping in. But a better plan is to construct a movable platform that can be placed alongside the spout for the melter to stand on. He can then use short bars and sticks, and has much better control of the tap hole than with the long bars and sticks.

At the tap hole is seen the skill of the melter in the results obtained from his labor. If the bed has been burned too much the first charge comes down fast and slack or dull. If the bed is too high the first iron is a long time in coming down. If too much fuel is used the iron melts slow and is dull toward the last if the heat is long. If the charges of iron are too heavy the iron comes dull at the end of each charge. If the charges of fuel are too large there is slow melting at the end of each charge. If the iron flows from the tap hole with great force and is difficult to control the sand bottom has too much pitch. If slag flows freely from the tap hole with the iron the hole is too large or the bottom has too much pitch. If the spout melts, crumbles or chips off, the material is poor or has not been properly mixed. If the tap hole cuts out the material is poor and the tap hole has not been properly made. If the tap hole gums up and cannot be kept open the front material is poor and is melted by the heat, and it may be melted by the heat when it is good if rammed soft and ragged inside. If the tap hole cannot be opened without a sledge and bar the bod bakes too hard and the material should be changed. If the bod does not hold, the material is not good or the bod is not put in right. If the cupola does not melt evenly through the heat and the same every heat, it is the fault of the melter and not of the cupola.

Half a Century in Business.

"A Golden Jubilee," is the title of a pretty little pamphlet about 4 inches square which reaches us from the Anshutz-Bradberry Company of Pittsburgh, Pa. It is issued in commemoration of the fiftieth anniversary of the establishment of the business and contains as a frontispiece a likeness of Henry Anshutz, who was the founder of the Anshutz Bradberry Company. The opening pages describe the primitive cook stove and heater and gradually lead up to a description of the Tremont stoves and warm air furnaces, which are made by the concern named. An interesting feature of the little pamphlet is found in the remarks about the firm and its members. In 1792 George Anshutz, an uncle of the founder of the firm, went to Pittsburgh and erected the first blast furnace west of the Alleghany Mountains. Fifty years later Henry Anshutz, his nephew, together with Christian and Philip Shauer, formed the firm that has developed into the Anshutz-Bradberry Company. The start was made with only four or five men, but the proprietors determined at the outset that everything from their foundry should be of the sort that would stand the test of time and public opinion and on that basis the business increased. In 1856 Henry Anshutz became sole owner of the business, but a few years later his two sons C. W. and John H. were taken into the firm, which then became H. Anshutz & Co. In 1872 John H. died and the firm became H. Anshutz & Son. On January 1, 1879, William T. Bradberry was admitted to the firm and the name was changed to Anshutz & Co. In 1886 Henry Anshutz, the founder of the firm, retired and his two sons Frank and Lewis A. were admitted as partners, the title of the concern being Anshutz, Bradberry & Co. On October 9, 1887, Henry Anshutz died after having lived to see the business he had started in a small way grow to one of the largest of its kind in the country. In 1892 William McCullough and L. M. Armor were admitted as partners and the firm was incorporated as the Anshutz-Bradberry Company. Following this reference to the history of the concern, the pamphlet describes the present plant and presents an illustration of the foundry in 1844 and at the present time. The officers of the concern are W. T. Bradberry, president; Frank Anshutz, vice-president; Lewis A. Anshutz, treasurer; William McCullough, secretary, and L. M. Armor, manager of the sales department.

Samuel Freeman.

At a recent meeting of the furnace and stove trade of Boston the following resolutions on the death of the late Samuel Freeman, for many years connected with the Magee Furnace Company of Boston and Chelsea, were adopted:

Whereas, It has pleased Divine Providence to call from among us our business associate, the late Samuel Freeman, whom we have known and respected for many years; therefore,

Resolved, That we, the members of the furnace and stove trade of Boston, hereby record our high estimate of his worth as a citizen, his sterling integrity of character as a business man, his faithfulness to his friends, his loyalty to his business associates and his enthusiasm in any cause which he espoused.

Resolved, That we extend our sincere sympathy to the family of the deceased in their affliction.

ODD PLATES.

To the correspondence department of Rathbone, Sard & Co.'s Albany plant has been added some artistic letter paper. It is embellished with a combination engraving of the various plants and offices of the company and is handsomely lettered. The design is particularly attractive.

The directors of the Warren Hardware Company of Warren, Ohio, held a meeting two weeks ago and appointed W. D. P. Knowlton, J. C. Shook and W. S. Kernaohan a committee to secure a site for the erection of a building 40 x 150 feet and two stories in hight, to be used in the manufacture of ranges. The plant now occupied by the company on Main street is inadequate for the purpose, and greatly increased facilities are necessary. The castings now used are made by the Trumbull Mfg. Company, but as soon as the new works are completed the castings will be made there. With their present facilities the company can turn out about 20 ranges a week, but with their new plant they expect to be able to turn out from 15 to 25 a day.

The Central Stove Works, which is a reorganization of the house of Forster Brothers, Lebanon, Pa., were incorporated during the past week, with a capital stock of $30,000. The Board of Directors includes John Fox, Col.

John B. Embich, Jacob E. Reinoehl, Richard Stanley, A. D Bechtel and George W. Black. The officers are Col. John B. Embich, president; Brooke B. Forster, secretary; Dr. J. R. Beckley, treasurer, and Charles Forster, superintendent.

PLANS for new houses, says the Philadelphia *Record*, are now generally made in that city with attachments for gas stoves.

THE STOVE MANUFACTURERS' REPAIR ASSOCIATION OF PEEKSKILL, N. Y., have been incorporated, with a capital of $12,550. Among the directors may be mentioned Henry T. Richardson, Joshua H. Cort and Robert B. Keeler.

AN ATTRACTIVE advertising novelty in the shape of an Acorn mirror has been gotten out by Rathbone, Sard & Co. of Albany, N. Y. It is of the same size and shape as the Acorn calendar and is done in blue and silver. On one side is a bit of glass that will be handy many times a day, as well as cause "reflections" on the value of Acorn stoves and ranges.

THE CORTLAND-HOWE VENTILATING STOVE COMPANY, Cortland, N. Y., resumed operations at their foundry with nearly a full force on Monday, March 26. The plant is one of the important ones of Cortland, and it reaumes operations after a shut down since early in December, running on orders for the fall trade.

THE PENINSULAR STOVE COMPANY of Detroit, Mich., are represented at Union City, Pa., by Fuller & Everson, who have met with gratifying success in the introduction of Peninsular stoves, ranges and heaters. In a recent issue of the Union City *Times* the firm presented a full page advertisement, profusely illustrated, and showing, among other things, views of Peninsular cook stoves and ranges. This firm are noted for their enterprise and push and are doing an excellent business.

FROM the Ajax Iron Works, Corry, Pa, a catalogue of the Daisy gas burners is received. The burners are made for cooking stoves, heating stoves and open grates, and large sectional burners are made for use in furnaces and boilers.

AN EASTER GREETING has been received from the Northwestern Stove Works of Minneapolis, Minn. It is a very pretty card, showing a colored picture, inclosed in a heavy mat, of two girls. The card is looped at one corner for hanging.

THE PHILLIPSBURG STOVE WORKS of Phillipsburg, N. J., resumed operations a short time ago with a force of about 50 men after a protracted shut down.

THE GEM CITY STOVE MFG. COMPANY of Quincy, Ill., have increased their capital stock to $70,000.

A PRESS DISPATCH from Marengo, Ill., under date of March 22, is to the effect that the employees of the Collins & Burgie Stove Company struck on that day for the restoration of 5 per cent. which had been taken from their wages.

DURING their recent shut down the Albany plant of Rathbone, Sard & Co. was thoroughly overhauled, and many arrangements made and improvements instituted to increase the facilities for turning out goods.

THE FULLER-WARREN COMPANY, Milwaukee and Chicago, have issued a little catalogue for the spring of 1894, which calls attention to the company's line of P. P. Stewart stoves and ranges adapted for all kinds of fuel. The opening pages are devoted to sectional views showing the company's patent oval fire box fitted with oscillating draw center anti-clinker grate, and also with duplex grate. The goods shown include, in addition to P. P. Stewart stoves, the Matchless, a six-hole range for hard or soft coal or wood, the F.-W. Co. steel oven range for anthracite coal made with single and double ovens, the Royal Diamond range for wood, and the National Diamond made from patterns of the Royal Diamond and having the same measurements and improvements.

THE HOWARD FURNACE COMPANY of Syracuse, N. Y., are mailing to their friends in the trade a card 5 x 7 inches in size, one side of which is used for the address and the other for advertising matter. The text is printed in red and white, the words "Howard Heaters Heat Houses" being in large display type. There are also given two illustrations of Howard heaters.

THE CLEVELAND FOUNDRY COMPANY of Cleveland, Ohio, have issued from the press an interesting catalogue of gas and oil cook stoves and heaters. The publication consists of 64 pages, each of which is ornamented with a fancy border, while the binding is in colored paper covers, carrying a side title which embodies the trade-mark of the concern. The company announce in the opening pages that the word "Puritan," as applied to oil, gas or vapor stoves, is their exclusive property and was registered as a trade-mark January 9, 1894. The catalogue is printed on a good quality of paper and profusely illustrated with cuts of the leading specialties of the company. These include the Puritan, Triumph, Defiance and Paragon oil stoves, the Acme sad iron heaters, the Puritan gas stoves and the Triumph and Puritan radiators. There is also shown a line of gas heating stoves made under the name Puritan; also the Banner, Favorite and Columbian oil heaters. Attention is also given to registers, sad irons and hardware specialties. The Eastern office and salesroom of the company is at 82 North street, Boston, Mass.

THE DANGLER STOVE & MFG. COMPANY of Cleveland, Ohio, have been assigned a patent for a heat radiator granted March 20 to Charles I. Dangler and Henry Ruppel of the place named. The invention relates to heat radiators of the variety in which gas is used for heating, and is a modification of the radiator set forth and claimed in an application filed April 6 of last year. In the present construction a single burner tube is employed, with a pair of circulating tubes, one upon each side thereof, connecting the top of the radiator with the base. The latter has openings in its edge through which the heated air is discharged into the room. The construction is such that as soon as the burner is lighted a free circulation of air is established in an upward direction in the center tube and downward in the side tubes, the heated air passing out through the openings in the front of the base. It is stated that the length of the route traveled retards the flow of the air just enough to insure good radiation, and in this respect the invention differs materially from a construction in which the burner is at the bottom of the tube and the discharge at the top. The burner tube in the present invention is provided at its lower end with a transparent globe or bulb, which serves to give out light as well as heat, thus making the device serve a double purpose.

J. D. MARVIN, representing Perry & Co. in New York City and on Long Island, has secured some very gratifying orders during the past week for gas and oil stoves. Mr. Marvin has had some 20 years' experience in the stove trade, and is well known among dealers from Maine to the Gulf of Mexico.

THE THATCHER FURNACE COMPANY of 33 Peck Slip, New York City, are actively pushing the sale of their No. 80 Thatcher range, provided with horizontal boiler. The stove is made with a fire box on either the right or left hand side, has 8-inch boiler holes, capacious oven and stands 30 inches high with a top surface 38 x 25½ inches. The range is made with or without water back, and is furnished with revolving or flat grate, as may be desired. The company's Champion steam heater is meeting with favor among architects, builders and the trade in general, several large orders having been received during the week for shipment to their agents in the West.

E. K. CONANT, 9 West Fourteenth street, New York, is showing the summer line of gas stoves made by the Dangler Stove & Mfg. Company, Cleveland, Ohio. This year the rangea have a handsome new front and a cabinet base. One of the special features is the oven ventilation, a current of hot air passing continually through, and so arranged that opening the oven door does not let the cool currents strike the food. A water heating coil for use in connection with a kitchen boiler is supplied this year with the smaller size and at a popular price. A patented device is used to deflect the flame of the cooking burner to the coil, and can be removed when the full heat is desired at the top of the stove.

GEO. F. PRENDERGAST has just finished a successful trip through New England, selling gas stoves for the Dangler Stove & Mfg. Company, Cleveland, Ohio. One of his new customers is the Gas Mfg. Company, at Haverhill, Mass., who are making their first venture in the gas stove business by placing an order for an assorted carload of the Dangler stoves.

WM. M. CRANE & Co., 838 Broadway, New York, made an exhibit of a model gas kitchen at the Food and Home Exposition at Lenox Lyceum. It was equipped with one of their steel ranges, with an adjustable rising hood, water heater, broiler and a variety of special gas cooking utensils and appliances. An exhibition of their practical use was given in the evening, when cooking, baking and broiling were done and the delicacies submitted for the approval of the interested visitors.

EDWARD LANGE is visiting the gas stove trade in New York in the interest of Geo. M. Clark & Co., Chicago, and showing the new features of the Jewel line of gas cooking and heating stoves.

E. O. & W. K. STAFFORD will open a branch office and warerooms at 7 West Fourteenth street, New York, May 1, as Eastern managers for the Milwaukee Gas Stove Company of Milwaukee, Wis. They now have on exhibition, temporarily at 4 West Fifteenth street, a fine line of the Perfection cast iron and steel ranges, hot plates, portable stoves, water heaters, heating stoves, grates, china kilns, tinners and plumbers' furnaces, coffee roasters and cooking uten-

sils. They will also act as the Eastern representatives of the Mosely Folding Bath Company of Chicago, Ill., and the Erwin Hydraulic Machinery Company of Milwaukee, Wis.

The March-Brownback Stove Company of Pottstown, Pa., have resumed operations at their works and are running steadily. They report a large demand for their Crown furnace. The furnace is made in two styles, portable and brick set, and is adapted to soft or hard coal. The construction of the furnace for soft coal is very unique. The air enters above the bridge and at a point which allows of the complete combustion of fuel and gases. The company state that last year's business was as good as could be expected, considering the depression which has prevailed. Collections have been slow and a lot of stock has been carried over.

William J. H. Gluck of Baltimore, Md., sends us a package of advertising matter relating to his leading specialties. One of the circulars illustrates and describes the Gluck four-hole cook stove, which is said to represent the culmination of 20 years' experience. The statement is made that "every feature that concerns the art of cookery has been investigated, every principle involved in the theory of drafts, juxtaposition of flues, size of fire box, shape of oven, and the loss of heat and air has been thoroughly examined and every known invention appropriated. The mixture of irons, its strength, its resistance to expansion and contraction so as to prevent cracking have been perfectly researched. Every good feature in the old pattern has been retained and all new improvements have been added, making the Gluck cook the most perfect stove ever invented." A well arranged catalogue of 20 pages gives attention to some of the leading stoves sold by Mr. Gluck, many of the engravings being reproduced directly from photographs. The list includes the Ivy Fortune five-hole range, the Active Fortune, with Hayes' horizontal boiler, the Westside range, the Home Fortune, the Regal Fortune, the Star Fortune and the Fountain. There is also shown a line of heaters, including the Electric Franklin and the Heckla Fortune. Other circulars give attention to stove boards, milk cans, Gluck's non-explosive oil stove, refrigerators, May Queen ice cream freezer, Iron Clad enameled iron ware, steam cookers, sand shovels and ovens for gasoline stoves.

Bergstrom Bros. & Co. of Neenah, Wis., manufacturers of Royal stoves and ranges, send us a batch of printed matter which they are now distributing. One circular illustrates the firm's patented deflecting damper, by means of which all the heat may be diverted to either side of the stove top, thus controlling the heat and applying it where it is most needed at the time. The other circulars consist of enameled blotting pads, one of which illustrates the Ensign four-hole range for soft coal and wood, fitted with deflecting damper; another shows the Medal four-hole range for wood only, fitted with patent deflecting damper; a third presents the Emblem four-hole range for hard coal and wood, which is made in various sizes and styles.

Eugene Munsell & Co. of 218 Water street, New York City, are renovating their five-story warehouse. When the improvements are completed the company expect to have one of the finest stove warehouses in the city. Their mica and micanite business has increased to such an extent that the entire third floor of the warehouse will be set apart for that department. A new telephone has been installed in their counting room, their telephone number being "968 Cortlandt," which can be used by dealers in remote sections of the city and nearby places in ordering Manhattan ranges, gas stoves, mica, &c.

Trade Notes.

In his advertisement, appearing elsewhere in this issue, W. J. Rothweiler, 98 Third avenue, Pittsburgh, Pa., directs attention of the trade, and of tinners particularly, to the Economy Hollow Punch. This punch is referred to as being self centering and automatic extracting. The fact is also referred to that with the use of this punch damage from careless use necessitates ordering simply a new cutter, rendering it unnecessary to throw away the entire tool. By this means a considerable saving in cost is effected. These cutters are referred to as being made of English cast steel, finely tempered, while the shanks are made of hexagon American steel, also tempered, to prevent wearing down as much as possible. The punches are made in sizes from ⅛ to 2 inches inclusive, and the further announcement is made that they are sent C.O.D. to any address, and the trade are invited to write for description and prices.

The Philadelphia Ornamental Wire Company, 18 North Sixth street, Philadelphia, Pa., make announcement to the trade that they have placed their line of Wire Goods and specialties in the hands of O. N. Stein, 35 Warren street, New York, where a full line of their samples can be seen.

R. G. Sykes of the Sykes Iron & Steel Roofing Company, Niles, Ohio, has made a proposition to the citizens of that place, agreeing to build a rolling mill and two sheet mills, with all necessary buildings, machinery and appliances to operate the same, and requiring 75 men to operate sheet mill, within six months from April 1, 1894. The company to be incorporated, with a capital stock of $100,000, one-half of which shall be paid up immediately, provided that the Council of Niles issues city bonds to the said Sykes in the sum of $10,000, which the said Sykes agrees to take at no less than par value. The proposition of Mr. Sykes was accepted by the Council of Niles, and it is probable that work on the new mill will be commenced within a short time.

The Ellwood Ivins Tube Co., Philadelphia, Pa., are drawing a series of tubing samples for C. D. Mosher, the marine engineer. When delivered they will be subjected to severe tests for the purpose of determining the availability of employing similar tubes in the construction of boilers to be erected in three or four United States naval vessels, contracts for which have been awarded him. This mill is also about commencing the manufacture of tapered tubes drawn in all metals, with walls of uniform thickness. They are now drawing high carbon tubes up to ¼-inch and low carbon to 5-inch, inclusive. In all the other metals they are prepared to draw seamless tubes from $\frac{1}{64}$ to 5 inches in diameter, any desired form, either round, square, corrugated, &c., with any thickness of wall. They call especial attention to their aluminum and aluminum bronze seamless tubing, the latter they assert never before made, especially valuable, they claim, on account of great tensile strength and rigidity of the metal, together with its non-corrodibility and high heat conductivity.

The Indestructible Clay Wick Company of New York were incorporated last week, to manufacture Clay Wicks for burning oils and other liquids in lamps, stoves and other devices; capital, $150,000; directors, Geo. L. Eastman, Jos. T. Murray, John F. Shennan, John A. Cutler and Martin A. Korff of New York City and Mrs. Ida R. Eastman of Brooklyn.

C. Pratt, 69 Beekman street, New York, is offering the Crown Asbestos Griddle, manufactured by Hall & Carpenter, Philadelphia, Pa., which is a novel cooking utensil designed for frying small quantities of food without scorching or burning, and is sold, we are advised, at a very moderate price.

Eaton, Cole & Burnham Company, 82-84 Fulton street, corner of Gold, will, on or about May 1, occupy their new quarters in the seven story building fast approaching completion, at the corner of Beekman and Gold streets. This building, which extends back from Beekman street to Ann, is within 200 feet of where they now are.

The Star Coupler Company, St. Louis, Mo., have increased their capital stock from $20,000 to $30,000. They report a heavy demand for their Star Water Back and Boiler Couplers, which, they advise us, are indorsed by all manufacturers and dealers in ranges and heaters. In their advertisement in this issue they state as follows: "Sample orders shipped to any address and satisfaction guaranteed." This will enable the dealer to judge for himself whether or not the device which this company are advertising is what they claim for it.

The workmen of the Crane Company of Chicago, manufacturers of wrought pipe and plumbers' and steam fitters' supplies, have struck against a reduction of wages. The company advanced the wages of their men last year voluntarily, in view of the fact that living expenses in Chicago had been raised considerably by the World's Fair, and they now make a reduction in order to be able to compete with other establishments in the same line who are making sales at very low prices. The officers of the company have treated their men so considerately in the past that they are of the opinion that the reduction now made should be accepted without a murmur, when it is certainly known that reductions have been made in workmen's wages almost everywhere else. Their workmen, however, look at the matter from another standpoint. Under the leadership of professional labor agitators, they assume that the corporation are so wealthy that they can afford to pay high wages indefinitely, and charge that the real reason for lowering wages is to get in position for cutting prices. They proposed arbitration and an examination of the books of the company to ascertain if the reduction was really warranted. This the company have rejected. About 2500 workmen are out of employment on account of this disagreement. As usual, they indulge in bitter speeches against their employers. They are endeavoring to induce the Building Trades Council of Chicago to declare a boycott on all goods made by the company so as to cripple them through their sales department. The employees of the Crane Elevator Company, another corporation managed by the same capitalists, are also on a strike against a reduction of 15 per cent. in their wages. They number about 200 men.

TRADE REPORT.

The Iron Market.

The feeling in the Iron trade throughout the country is a slight shade better, and is due chiefly to the fact that the large Pittsburgh mills seem to have gotten their order books into slightly better shape, and are not as desperate as they were. Billets are firmer and cannot now be bought under $15.50, Pittsburgh.

Merchants and mills are crowding buyers for specifications on the ground that they have intimations from the railroads that present cut rates of freight may be recalled at any time and higher figures be substituted at ten days' notice.

Pittsburgh and Valley Foundry Iron makers are hunting for orders in Eastern territory, and claim to have a further fighting margin if present prices made by them do not bring them the business they want. Some consumers of Foundry Iron are taking advantage of the eagerness of sellers and are contracting for Iron far toward the end of the year. But the great majority cannot be tempted by any concessions to engage their future requirements.

No one expects a revival of business before something final has been done in Congress. Since even the most sanguine in Washington hold out little hope before the end of June, buyers feel pretty confident that chances now offered will occur again at some time during the next three months. Under the circumstances the stocking up movement which is expected to start the quick upward turn is yet quite far off—apparently.

While this condition of affairs continues no lasting rise in prices is looked forward to. As it is, the withdrawal of one great seller simply brings another hungry mill into prominence. Still, record breaking has pretty well stopped, although the lowest prices are still being made on every important transaction coming up.

American Pig.—The market in the immediate vicinity of New York has continued quiet, although the situation has become more complicated through the more urgent offering of Pittsburgh, Mahoning and Shenango Valley Foundry Irons. Excellent Iron from the last two districts is being offered at $12.30 for No. 2 Foundry, and it is intimated that even lower figures can be made for tempting business. The majority of sellers of standard brands decline to contract beyond July, but some of the Southern furnaces are going beyond that time at current prices. Virginia furnaces in particular are competing sharply and are giving long time options to capture new trade. The furnaces in the Lehigh Valley have been granted reductions in freights to New England points, the rates to Worcester, Springfield and other points having been made $1.75 against $2.50 formerly. It is reported also that the Eastern Pennsylvania furnaces are getting cheaper anthracite coal, and have secured lower freights on ore and other materials. We quote standard brands $12 75 @ $13.50 for No. 1; $12 @ $12.50 for No. 2, at tidewater. Southern Iron, same delivery, $12.25 @ $13 for No. 1; $11.00 @ $11.50 for No. 2; $10.75 @ $11.25 for No. 3; $11.25 @ $11.75 for No. 2 Soft, and $11.75 @ $12 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10.50 @ $11.

In the Philadelphia district the Pig Iron market holds its own, which, under the circumstances, is a satisfactory feature. With 10,000 tons a week increase in the supply, and with lower freights from competing points, this circumstance is regarded as surprising. There is, however, no certainty in regard to the immediate future, although with a moderate increase in the demand somewhat better prices might be expected, or the reverse if the supply keeps on increasing without a corresponding increase in consumption. General quotations are about as follows for Philadelphia and equivalent points, with the heaviest end of the business at inside figures:

No. 1 Foundry	$13.00 @	$13.25
No. 2 Foundry	12.25 @	12.50
No. 1 Soft	12.00 @	12.25
No. 2 Soft	11.00 @	11.50

The Chicago market has been less active, but local Irons have taken the lead in whatever business has been done. Large transactions are rare, the week showing but one sale of 1000 tons. Southern manufacturers appear to be anticipating a drop in freight rates, as they are now endeavoring to make contracts at a delivered price instead of at the furnace, as heretofore Lake Superior Iron is moving only in single carloads, but the time is fast approaching when some good sized contracts are to be expected from large consumers who have not yet completely given up the use of Charcoal Pig Iron. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @	$15.25
Local Coke Foundry, No. 1	11.75 @	12.25
Local Coke Foundry, No. 2	11.00 @	11.75
Local Coke Foundry, No. 3	10.75 @	11.00
Local Scotch	12.00 @	12.50
Ohio Strong Softeners No. 1	13.00 @	14.00
Southern Silvery, No. 1	@	12.50
Southern Silvery, No. 2	@	11.75
Southern Coke, No. 2	11.25 @	11.50
Southern Coke, No. 3	10.75 @	11.00
Southern, No. 1, Soft	11.25 @	11.50
Southern, No. 2, Soft	10.75 @	11.00
Tennessee Charcoal, No. 1	15.50 @	16.00
Tennessee Charcoal, No. 2	15 00 @	15.25
Alabama Car Wheel	18.50 @	18.65
Jackson County Silvery	15.00 @	16.00
Other Ohio Silvery	13.00 @	13.50

There is not a great deal of Pig Iron offering in the Pittsburgh market just now, nor on the other hand is there a heavy demand for it. Foundry Iron is neglected and weak in price. Quotations are given as follows:

No. 1 Foundry	$11.50 @	$11.75
No. 2 Foundry	10.50 @	10.75

Weakness has been the characteristic feature of the week in Southern Pig Iron markets. The volume of business is reported as fair in a small way and there was a good inquiry for moderate quantities from one to ten carloads, with sales generally effected, for there is a disposition to supply the wants of consumers without allowing the price to interfere. For instance, No. 2 Foundry has been sold on the basis of $7 ℔ ton, f.o.b. Birmingham, and if there was any demand for No. 1 a relatively low price would doubtless be made, for there is an accumulation of stock, while the lower grades are better sold up and are less urgently offered. There is no movement in Charcoal Iron. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$11.00 @	$11.25
Southern Coke, No. 2	9.75 @	10.00
Southern Coke, No. 3	9.50 @	9.75
Ohio Soft Stone Coal, No. 1	14.50 @	15.50
Ohio Soft Stone Coal, No. 2	14.25 @	14.50
Lake Superior Coke, No. 1	13.00 @	13.50
Lake Superior Coke, No. 2	12.00 @	12.25
Hanging Rock Charcoal, No. 1	17.00 @	17.50
Hanging Rock Charcoal, No. 2	16.50 @	17.00
Tennessee Charcoal, No. 1	13.50 @	14.00
Tennessee Charcoal, No. 2	12.50 @	13.00
Standard Southern Car Wheel	16.75 @	17.50
Lake Superior Car Wheel and Malleable	16.50 @	17.00

Metal Market.

Pig Tin.—Straits Tin has advanced in price to the extent of about ¼¢ ℔ lb. Five-ton lots were sold at 19.30¢, net cash, for prompt delivery, and 19.40¢ @ 19.50¢ was paid on the exchange for August delivery. Speculation is still very tame and almost wholly between a few local operators, but sales to jobbers and consumers have increased somewhat and made quite an impression upon the stocks in importers' hands. Still, the consumptive demand is hardly up to the average for this season of the year. Prices for small retail lots of Tin remain at about 21¢ ℔ lb from store. The advance in price of the metal during this month has been marked, especially in respect to future deliveries. Early in the month April delivery was offered at as low as 18.25¢ and distant futures at a considerable dis-

count, including August at 17¢. During the past week April delivery went to 19.25¢ and sales were recorded of August at 19.40¢ @ 19.50¢. This radical change in quotations is at least suggestive.

Copper.—Reports were decidedly in contrast with those of the preceding week, as far as reference to business is concerned. Without exception they indicated a decided falling off in transactions, and were not without evidence that the demand has dropped off in a somewhat surprising manner. The offering has, meanwhile, continued quite free and of sufficient weight to slightly weaken prices. Thus 9.50¢ has become a common selling price for Lake Superior Ingot here, while private advices intimate that a lower rate has been quoted in the English market. Electrolytic has been sold here at 9.30¢, and rumors prevail of business having been put through at a shade less, but it is claimed now that Pig Copper can be sold at a relatively better price in foreign markets. Casting Copper, well known brands, is offered at 9⅛¢, and as low as 9¢ is said to have been accepted for some that are not very popular. Jobbing prices for small quantities of Lake Ingot are rather easier, 10⅛¢ ℔ lb being now about the outside asked.

Sheet Copper.—In another column will be found the new price-list agreed to by all the Copper manufacturers of the United States for Sheet and Bolt Copper and Copper Bottoms, in order to regulate the market for these materials. The new terms are net, without discount. For small retail lots from store an advance of about 1¢ a lb is generally charged over the list prices. The demand for Sheet Copper has sagged off considerably during the past week, and purchases by consumers are on a very conservative scale.

Pig Lead.—Sales have fallen off considerably, but prices are held quite firmly. The demand is much slower than it was during the ten days or fortnight preceding the week under review, and the appearances are that dealers who sold "short" some time ago have covered to a great extent. There is little trade demand at present, in any event, and large consumers seem to be quite indifferent, while the requirements of the smaller consumers appear to be exceedingly moderate. Prices stand at 3.40¢ @ 3.50¢, according to brand and terms of sale, with an advance of about ⅛¢ for small jobbing lots.

Spelter.—There has been no improvement in business here, and purchases at other points, it is reported, have fallen off more or less. To this extent the market is weaker in tone. Prices are not positively lower, however, and the offering is not much freer, if at all larger, than it has been previously this month. Prices do not vary a great deal from the basis of 3.80¢ @ 3.85¢ for ordinary Western brands, with the usual premium on small quantities.

Sheet Zinc.—Business is behind the average for the season, and prices are inclined to softness. Quotations are 4¾¢ ℔ lb for cask lots and 5¼¢ for smaller quantities.

Tin Plates.—Although orders are somewhat more numerous than they have been of late, the aggregate volume of business does not show much, if any, increase. Calls are almost entirely for small lots for present use, and all buyers seem to be entirely conservative in their purchases. Dealings are, on the whole, backward for the season. Futures are generally neglected, and the business passing is little beyond what is forced by imperative wants. Roofing Plates are spoken of as the most active feature of the market at present. Little, if any, concession in prices has been made, but selling pressure is still sufficient to keep the market weak in tone. A special cable dispatch from London to *The Iron Age*, of March 28, reports the British Tin Plate market to be without radical change. Special sizes have been in quite good demand, but business otherwise has been confined to cheap lots for prompt shipment. Included in the latter were 14 x 20 Bessemer Cokes at 9/9, f.o.b. Wales. Liverpool quotations are quoted as follows:

IC Charcoal, Alloway grade	12/ @ 12/6
IC Bessemer Steel, Coke finish	@ 10/6
IC Siemens " "	11/ @
IC Coke, B. V. grade, 14 x 20	Nominal.
Charcoal Terne, Dean grade	10/ @ 10/6

Sheet Iron.—Black Sheets are dull and prices weak. Galvanized Iron is, however, moving fairly well and maintains a firm tone.

Production of Spelter.

David T. Day. Chief of the Division of Mining Statistics and Technology, United States Geological Survey, has issued the following preliminary statement by C. Kirchhoff, agent, of the production of Spelter and Zinc Oxide for the year 1893:

Production of Spelter in the United States, by States (Short Tons).

States.	1891.	1892.	1893.
Eastern and Southern States	13,162	14,495	12,684
Illinois	28,711	31,383*	29,596
Kansas	22,747	24,715	22,815
Missouri	16,253	16,567	13,737
Totals	80,873	87,160	78,832

*Including Indiana.

The decline in the output took place entirely during the second half of the year, as follows:

States.	First half 1893.	Second half 1893.
Eastern and Southern States	7,380	5,304
Illinois	16,427	13 169
Kansas	13,269	9,546
Missouri	8,718	5,019
Totals	45,794	33,038

Stocks of Spelter on January 1, 1894, were as follows:

Stock of Spelter.

States.	January 1, 1893.	January 1, 1894.
Eastern and Southern States	3,316	3,796
Illinois	12	974
Kansas	483	335
Missouri	349	379
Totals	4,160	5,484

The exports of domestic Spelter in the past year were 3639 tons in 1893, and 6247 net tons in 1892, as compared with 2147 net tons in 1891.

The production of Zinc Oxide is estimated at 24,059 tons, of which 14,954 net tons was produced in the Eastern district, as compared with 19,129 tons in 1892, and 9150 was made in the West in 1893, as compared with an estimate of 7700 tons in 1892.

The American Metal Company have issued the annual statement of Henry R. Merton & Co. on the production of Spelter in Europe:

Spelter Production in Europe.

	—Gross tons.— 1893.	1892.
Rhine District and Belgium	149,750	143,305
Silesia	90,310	87,760
Great Britain	28,375	30,310
France and Spain	20,585	18,662
Austria	7,560	5,120
Poland	4,530	4,270
Total Europe	301,110	289,327

Chicago Report.

Scrap.—Cast Scrap is moderately active, but other descriptions of Old Material are neglected. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Prices are very weak in the absence of a demand. Carload lots of 12 net tons or over are nominally quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.	
Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

THE NUBIAN IRON ENAMEL COMPANY of Cragin, Ill., announce that the second edition of their Nubian calendar is now ready for distribution. It will be mailed on application.

CONDITION OF THE

Hardware Trade.

MARCH draws to a close with a fair volume of business, there having been during the past week or two a perceptible improvement. The demand was doubtless stimulated by the fine spring like weather which prevailed, and has not apparently been seriously affected by the subsequent cold snap, which, however, it is feared has done more or less damage to the crops. It is noticeable that the trade are purchasing a greater variety of goods than for some time, their orders covering both Heavy and Shelf Hardware and seasonable goods. There is also more inquiry for Builders' Hardware and Mechanics' Tools, all the orders indicating that stocks in dealers' hands are light and that the trade are purchasing conservatively. Several houses supplying manufacturers report that their orders indicate an improvement in the demand which is made on the manufacturers and their resumption of more energetic and enterprising efforts in the prosecution of their business. Prices, we regret to report, are in a condition far from satisfactory, and on many lines of goods there is a disposition to name lower prices than have heretofore prevailed. There is also a good deal of irregularity in the prices of the jobbing trade, and some of them are naming exceptionally low prices with a view to inducing business. This cutting of prices is to be regretted, as its natural tendency is to diminish the jobbers' profits. The financial condition appears to give little cause for complaint or apprehension, collections being fair.

Advices from Chicago.—The very cold weather of the past few days has not yet been felt in any diminution of trade. The spring thus far has been extremely favorable to the Hardware interests. There has been no mud blockade, as usual. The farmers are much ahead of previous years in their preparations for crops, and are now making improvements which involve the consumption of considerable Hardware. The movement in Shelf Hardware shows more activity within the past week, and jobbers expect that March will be abreast of March of last year. The demand for small goods shows a heavy gain during January and February. The proportion was one-half to two-thirds of staple goods, but now three-fourths of the business consists of small goods and straight Hardware. An excellent business is being done in seasonable goods. Tinware and Metals are quiet. Heavy Hardware jobbers report a decided gain in the volume of business. Orders are now coming in from Carriage builders who have deferred active operations so long that they will be obliged to push things actively in order to be in proper shape to transact business this year. The demand is excellent from other manufacturing consumers who purchase supplies from the jobbers.

Notes on Prices.

Wire Nails.—These goods continue in excellent demand, and the aggregate of the business for the current month will be large. There is some complaint in regard to prompt shipments, but as a rule orders are being executed without delay. There is, however, no accumulation of stock in the hands of the manufacturers. In the matter of price the market is perhaps not quite so strong as it has been, and is represented by the quotation of $1.05 to $1.10 for carload lots at mill, the former figure being usually obtainable on good orders, while it is shaded by some of the manufacturers in special cases. Some of the mills, however, refuse to make a lower price than $1.05. Small lots from store in New York are held at $1.25 to $1.30.

Advices from Chicago.—The reduced price put in effect here upon the lowering of freight rates appears to be generally maintained. Manufacturers are well supplied with orders for future shipment, extending certainly over the next four weeks, and perhaps further. Orders for immediate delivery have been refused in some cases, because manufacturers are unable to fill them. Factory quotations are equivalent to about $1.10, Chicago. Jobbers are holding prices to the country trade at $1.20 to $1 25, but on city business there is some little irregularity. Their carload trade is light at present.

Cut Nails.—The demand for Cut Nails continues fair and the mills report the receipt of many orders, though, as a rule, they are for comparatively small quantities, the trade pursuing a conservative policy and refusing to buy beyond their immediate requirements. Some of them refer to the fact that they can see evidence of a reaction in some sections from the use of Wire Nails and a return to Cut Nails. The prices of the Eastern manufacturers for Nails delivered at the principal points in their territory are as follows: New York, Albany, Boston and Savannah, $1.05; Buffalo, $1.02; Harrisburg and Philadelphia, $1. In view of the active competition with Wire Nails and under a desire to secure what business there is going the above prices are shaded 5 and in some cases 10 cents. The price quoted for Nails from store in New York is $1.10 and $1.15.

Advices from Chicago.—Manufacturers are much pleased with the trade they are having this spring, which exceeds their expectation. While orders from the South and Southwest are large the local demand has also been good, and in some cases jobbers' orders have been unusually heavy. Specifications are coming in freely on contracts and inquiries continue to promise good business. Factory prices are now $1 on 55-cent average. Jobbers quote small lots from stock at $1.15.

Barb Wire.—The manufacturers of Barb Wire are to be congratulated on the steady and large demand and also on the regularity which characterizes prices. The trade are continuing to purchase freely and the mills are fully occupied. There does not, however, appear to be any difficulty in obtaining Wire promptly. Quotations are on the following basis for carload lots of Four Point Galvanized: Pittsburgh, $2.15; Cleveland, $2 20; Cincinnati or Allentown, $2.25; Chicago or New York, $2.35, with an advance of 5 cents per 100 pounds in less than carload lots.

Advices from Chicago.—Trade in both Plain and Barb Wire keeps up exceedingly well and prices are strong. The demand is of the same character as previously noted. Those who usually buy in carloads are taking ton lots, but they are buying much oftener, and the volume of business is kept up. Quotations are $2.35 to $2.40 for small lots of Galvanized Barb Wire from stock and $2.25 to $2.30 for carloads.

Sheet and Bolt Copper.—For some time past the market for Sheet and Bolt Copper has been irregular, the list having been quite generally discarded and much lower net prices made, representing, it is said, in some cases a discount of 50 per cent. With a view to correcting this condition of things, a revised list bearing date March 22 has been issued by the manufacturers and is printed below. Some changes have also been made in the extras. The new list, which is to a certain extent provisional and may perhaps be modified before long, is as follows, terms cash without discount:

Sheet Copper, per lb., cents.		64 oz. and over.	32 oz. and up to 64 oz.	16 oz. and up to 32 oz.	14 oz. and up to 16 oz.	12 oz. and up to 14 oz.	10 oz. and up to 12 oz.	8 oz. and up to 10 oz.	Lighter than 8 oz.
Not wider than 30 inches.	not longer than 72 inches.	14	14	14	15	16	17	20	22
	longer than 72 inches.....	14	14	14	15	17	19	23	...
Wider than 30 inches but not wider than 36 inches.	not longer than 96 inches.	14	14	14	16	18	22	25	....
	longer than 96 inches.....	14	14	15	17	19	23	27	....
Wider than 36 inches but not wider than 48 inches.	not longer than 96 inches.	14	14	16	18	20	24	..	...
	longer than 96 inches. ..	14	14	17	19	21	25	....	....
Wider than 48 inches but not wider than 60 inches.	not longer than 96 inches.	14	14	19	21	26	... ..		...
	longer than 96 inches....	14	15	20	23	. ...	.....	....	....
Wider than 60 inches but not wider than 84 inches.	not longer than 96 inches.	15	16	21	25	.....	.....		....
	longer than 96 inches. ..	16	17	22	27	.....	....	...	..
Wider than 84 inches....		17	19	....	.....	. .	....	..	...

Bolt Copper, ¾ inch diameter and over, 14 cents per pound.
Circles, Segments and Pattern Sheets, 60 inches wide and less, 3 cents per pound advance over price of sheets required to cut them from.
Circles, Segments and Pattern Sheets, over 60 inches to and including 96 inches, 4 cents per pound advance over price of sheets required to cut them from.
Circles, Segments and Pattern Sheets, over 96 inches, 5 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.
All Copper polished one side, not over 20 inches wide, 1 cent per pound additional to cold rolled prices.
All Copper polished one side, over 20 inches wide, 2 cents per pound additional to cold rolled prices.

Tinning.

	Cents.
Tinning Sheets, on one side, 10, 12 and 14 x 48.....each	6
Tinning Sheets, on one side, 30 x 60.....each	25
For Tinning Boiler Sizes, 9 inches (Sheets 14 x 60 inches).....each	12
For Tinning Boiler Sizes, 8 inches (Sheets 14 x 56 inches).....each	10
For Tinning Boiler Sizes, 7 inches (Sheets 14 x 52 inches).....each	8
Tinning Sheets, on one side, other sizes.....per square foot	2

For Tinning both sides, double the above price.

Copper Bottoms, Pits and Flats.

	Cents.
14 ounces and over to square foot....	18
12 ounces and up to 14 ounces square foot.....	19
10 ounces and up to 12 ounces square foot.....	21
Lighter than 10 ounces square foot..	24

All circles under 8 inches in diameter, 2 cents per pound more than foregoing price, and no circles over 13 inches in diameter shall be classed as Copper Bottoms.

Galvanized Iron Deflectors.—Baker & Smith Company, 193–197 Van Buren street, Chicago, Ill., have issued the following price list of Galvanized Iron Deflectors for Radiators, f.o.b. Chicago, ready for bronzing:

Loop.	No. 1.	No. 2	No. 3.	No 4 with evaporator.
2	$2.00	$2.60	$3.20	$4.10
3	2.25	2.85	3.45	4.35
4	2.50	3.10	3.70	4 60
5	2.75	3.35	3.95	4.85
6	3.00	3.60	4.20	5.10
7	3.50	4.20	4.90	6.95
8	4.00	4.80	5.60	7.80
9	4.50	5.40	6.30	8.65
10	5.00	6.00	7.00	9.50
11	5.50	6.60	7.70	10.35
12	6.00	7.20	8.40	11.20
13	6.50	7.80	9.10	12.05
14	7.00	8.40	9.80	13.90
15	7.50	9.00	10.50	14.75
Add for each additional loop :	.50	.60	.70	.85

The Ellis Warming Box.—This article was described in our last issue as put on the market by J. T. Ellis, Box 262, Newark, N. J. The Warming Box is sold to the trade at $1 each, subject to a discount of 25 per cent.

Heath's Ball Valve Pump.—This Pump is being put on the market by the S. F. Heath Cycle Company, Minneapolis, Minn. It was described in a recent issue. It is sold to the trade from the following list, terms 30 days net, or 5 per cent. discount for cash received in ten days from date of invoice :

	Each.
In lots of 6 to 12 Pumps.....	$1.50
" " 13 to 50 Pumps.....	1.35
" " 51 to 100 Pumps.....	1.20

Sanitary Garbage Pail.—This Pail was described in a recent issue as put on the market by the Sanitary Garbage Pail Company, Detroit, Mich. The Pails are sold to the trade at $21 per dozen for the 12-gallon size and $33 per dozen for the 20 gallon size.

Glass.—The demand for Window Glass continues moderate and the market is without special feature. Pittsburgh quotations remain as before—85 and 10 and 5 per cent. discount for single, and 85 and 20 per cent. discount for double strength Glass. The total number of pots in operation at the present time is said to be 942, but it is expected that a number of factories will resume operations within the next week or two. An advance has just taken place in French Window Glass, which is now held at 80, 10 and 5 per cent. discount. A satisfactory condition of things is reported in Imported Glass circles, the demand being fair, with an encouraging outlook for the future.

Old Metals.—The demand for certain lines of Scrap Iron is better, but as the supply is abundant prices show no change. The market for Old Metal in general continues narrow and weak. The following quotations represent dealers' purchasing price in New York:

Heavy Copper.....	℔ 7¢
Light and Tinned Copper.....	℔ 6¢
Heavy Brass.....	℔ 5¢
Light Brass.....	℔ 4¢
Lead.....	℔ 3¢
Tea Lead.....	℔ 2½¢
Zinc.....	℔ 2¼¢
No. 1 Pewter.....	℔ 15¢
No. 2 Pewter.....	℔ 6¢
Wrought Scrap Iron....℔ gross ton.....	$7.50 @ $8.50
Heavy Cast Scrap.....℔ gross ton.....	7.00 @ 8.00
Stove Plate Scrap.....℔ gross ton.....	4.00 @ 5.00
Burnt Iron, ℔ gross ton...	3.50 @ 4.00

Old Rags, Paper, &c.—Prices continue low and the demand moderate. Quotations are nominally as follows:

No. 1 White Rags.....	℔ 3¼ @ 3½¢
No. 2 White Rags.....	℔ 2¼ @ 2½¢
Mixed Rags.....	℔ ¾¢
Blues and 3ds.....	℔ 1 @ 1¼¢
Hard Sized White Shavings	℔ 2¼ @ 2½¢
No.1 White Book Shavings	℔ 2 @ 2⅛¢
No.2 White Book Shavings	℔ 1 @ 1⅝¢
Light Book Shavings.....	℔ ¾¢
No. 1 Mixed Shavings.....	℔ ¾ @ 1 ¢
No. 2 Mixed Shavings.....	℔ ½ @ ¾¢
No. 1 Printed Books	℔ 1 @ 1¼¢
Ordinary Mixed Books....	℔ ½ @ ¾¢
Newspapers	℔ 2-5 @ ½¢
No. 1 Manila Paper.....	℔ 1 @ 1½¢
No. 2 Manila Paper.....	℔ ⅝ @ ¾¢
Bogus Paper.....	℔ ½¢
Common Paper.....	℔ ⅝¢
Straw Chips.....	℔ ½¢
Binders' Clippings.....	℔ ½ @ ⅝¢
Jute Butts.....	℔ 1⅞ @ 2 ¢
No. 1 Jute Bagging.....	℔ 1 @ 1¼¢
Mixed Bagging.....	℔ ¾ @ 1 ¢
No. 2 Bagging.....	℔ ½ @ ¾¢
Hemp Twine.....	℔ 2 @ 2¼¢
Manila Rope.....	℔ 2¼ @ 2⅝¢
Jute Rope.....	℔ 1½ @ 1¾¢
Mixed Rope.....	℔ ¾ @ ⅛¢

Old Rubber.—Market narrow and prices irregular. The following quotations are those ruling for Old Rubber delivered in this city:

Car Springs, ton lots, ℔.	@ $0.03¼
Rubber Shoes, carloads, delivered at factory, ℔..	@ .03
Rubber shoes, less than carloads, ℔.....0.02¼	@ .03⅛
Large Hose, ℔ ton.....	@ 9.00
White Wringer Rolls, ℔.	@ .04¼
White Syringes, ℔	@ .05

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Metal and Miscellaneous Prices.

CHICAGO, MARCH 29, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

Per box.

Vallaud and MelynGrade { IC, 10 x 14.....@ $6.75; IC, 12 x 12.....@ 6.75; IC, 14 x 20.....@ 6.75; IC, 20 x 28.....@ 13.50; IX, 10 x 14.....@ 8.75; IX, 12 x 12.....@ 8.75; IX, 14 x 20.....@ 8.75; IX, 20 x 28.....@ 17.50; DC, 12½ x 17.....@ 6.50; DX, 12½ x 17.....@ 8.50

Allaway Grade, { IC, 10 x 14.....@ 6.35; IC, 12 x 12.....@ 6.35; IC, 14 x 20.....@ 6.35; IC, 20 x 28.....@ 12.70; IX, 14 x 20.....@ 7.85; IX, 20 x 28.....@ 15.20

Coke Plates—Bright.

Per box.

Steel Coke—IC, 10x14, 14x20..$5.65 @$5.75
IC, 14x20.90 lb.....@ 5.25
IC, 14x20, 100 lb..5.50 @ 5.65
10 x 20.....@ 8.50
20 x 28...11.30 @11.50
IX, 10x14, 14 x 20.....@ 7.25
B.V. Grade. IC, 10x14, 14x20.5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—
IC. 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—
IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20..$9.25
Royal, extra. IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch, IC, 20 x 28.....@$11.25
Crescent, IC, 20 x 28.....@ 11.75
Crescent, IX, 20 x 28.....@ 14.75
Empire, IC, 20 x 28.....@12.00
Empire, IX, 20 x 28.....@15.00
Hickory, IC, 20 x 28.....@ 12.50
" IX, 20 x 28.....@ 15.50
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 15.00
" IX, 20 x 28.....@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28.....@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28.....@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28.....@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28.....$23.60
Westmoreland:
IC, 20 x 28.....$11 75
Juno:
IC, 14 x 20.....$5.75
IC, 20 x 28.....11.50
Illinois, Old Method:
IC, 20 x 28.....$17.00
E. L.:
IC, 20 x 28.....$12.50
Jessie:
IC, 20 x 28.....$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20.....$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20.....11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28.....19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28.....22.00
Neville, Stamped, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28..... 12.50
" " IX, 20 x 28.....15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared).....$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared).....19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared).....16.50
Columbia, IC, 14 x 20 (Stamped).... 7.25
" IC, 20 x 28 (Stamped)....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28.....13.00
Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28.....12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 .....12.00
Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
" (Redipped), IC, 20 x 28.....17.00
Old Process:
IC, 14 x 20..... 9.25
IX, 14 x 20.....11.25
IC, 20 x 28.....18.50
IX, 20 x 28.....22.50
H. B. L., Old Style:
IC, 14 x 20..... 7.75
IX, 14 x 20..... 9 25
IC, 20 x 28.....15.50
IX, 20 x 28.....18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 4-10¢	3 ¢
17 to 20	₩ lb 2 5-10¢	3 1-10¢
21 to 24	₩ lb 2 6-10¢	3 2-10¢
25 and 26	₩ lb 2 7-10¢	3 3-10¢
27	₩ lb 2 8-10¢	3 4-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ lb A, 10¼¢; B, 9¼¢ dis. 5%
Craig's Polished Sheet Steel.....8¼¢

Galvanized.

Juniata or first quality.....dis. 75%

Copper—

Ingot.

Lake.....11¢ @ 11½¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list, 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing.
(No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ₩ 100 lb.

Above 5-16 inch to 3 inch inclu...35¢
Plain, above 3 inch.....45¢
Plain, 5-16 inch.....45¢
Plain, ¼ inch.....60¢
Plain, 3-16 inch.....$1.00
Plain, ⅛ inch.....$1.50
Fancy Tubing, Brass, to No. 20 incl.....43¢ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.....

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 lb casks.....4¾¢
300 lb casks.....5 ¢
Loose sheets.....5¼¢

Lead—

Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12½¢@12¾¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12½¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain.....60&10%
1¼ and under, Galv.....52½&10%
1½ and over, Plain.....70&10%
1½ and over, Galv.....60&10%
Boiler Tubes, list Oct. 24, 1892.....70&10%
Casing, list Nov. 16, 1892.....52½ %
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.50 square
Climax.....$3.35 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.50 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....₩ lb, 2 ¢
" " Brown.....₩ lb, 1½ ¢
" " Purple.....₩ lb, 2½ ¢
" Ground in oil, B. Red ₩ lb, 6½ ¢
" Ground in oil, Red..₩ lb, 6½ ¢
" Ground in oil, Brown ₩ lb, 5½ ¢
" Ground in oil, Purple ₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls.....54¢
Linseed Oil, Raw, in bbls.....51¢
Mineral Paints.....2@4 ¢
Orange Mineral.....9¾¢
Pure White Lead in Oil.....6@6½¢
Dry White Lead in bbls.....5½@5¾¢
Red Lead, American.....6@6½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ₩ gal.....84¢
Spirits Turpentine, in bbls., ₩ gal...37½¢
Asphaltum, Trinidad Refined, ₩ ton..$45
Tarred Felt, 1 Ply, ₩ 100 lb.....$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet.....$1.70
Roofing Pitch, ₩ bbl. of 300 lb.....$3.00

NEW YORK, MARCH 30, 1894

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:
Small lots.....₩ lb, 75¢
100-lb lots.....₩ lb, 73¢
Ton lots.....₩ lb, 70¢
No. 1 Alum num (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....₩ lb, 70¢
100-lb lots.....₩ lb, 65¢
Ton lots.....₩ lb, 60¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....₩ lb, 65¢
100-lb lots.....₩ lb, 60¢
Ton lots.....₩ lb, 55¢

Antimony—

Cookson.....₩ lb, 10½¢
Hallett's.....₩ lb, 10 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

Per lb.

Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive....$0.35
Plain, to No. 20, above 3 inch.... 45
Plain, 5-16 inch to No. 20..... 45
Plain, ¼ inch..... 60
Plain, 3-16 inch..... 1.00
Plain, ⅛ inch..... 1.50
Fancy Tubing to No. 20, inclu.... 43

25@30%

Copper and Bronze Tubing—

3¢ ₩ lb more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ₩ lb
Over 3½ to 5 inches inclusive.....18 ₩ lb

Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ₩ lb
Over 3½ to 5 inches inclusive.....19¢ ₩ lb

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..13¢ ₩ lb, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10 ¢
Ausonia Grade Casting.....9¼¢

Planished.....net

Sheet and Bolt. ....15¢ ₩ lb, net, basis

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.90	1.20 per doz..20%

Elbows and Shoes—

Flat Crimp,

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2.80	2.90¢
Nos. 17 to 21	₩ lb. 2.70	3.00¢
Nos. 22 to 24	₩ lb, 2.80	3.10¢
Nos. 25 and 26	₩ lb. 2.90	3.20¢
No. 27	₩ lb. 3.00	3.30¢
No. 28	₩ lb, 3.05	3.40¢

American B. B.....₩ lb, 4¢@4¼¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11¾@12½¢
Patent Planished....₩ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....₩ lb, 8¾¢

Galvanized.

	B. B.
Nos. 10 to 16	7½@8.5%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Filter Joints—

Lee's.....83⅓%

Lead—

American Pig.....3½¢@4¢
Bar.....4¼¢
Pipe.....5¾¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6½¢, 20%

Old Lead in exchange, 2¾¢ ₩ lb.

Metal Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¼ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1¾ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

ntty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans..... .01½ @ .02⅛
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.0
Asphaltum, Rock, ₩ ton..... $14.0
Coal Tar Felt, 1 Ply, ₩ ℔.....2
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1 42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl.....$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10
Other sizes.....55@55&10
Cast-Iron Fittings, Tarred, sizes 2 to 6 Inches.....60@60&10
Other sizes.....65@55&10

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4½	38½¢
Rock Wool, ordinary	2¾	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....₩ bbl. $1.19@$1.20
Rosin, E. & F..... ₩ bbl. $1.30@$1.45
Rosin, G. & H.....₩ bbl. $1.65@$1.90
Rosin, I. & K.....₩ bbl. $2.25@$2.60
Rosin, M. & N.....₩ bbl $2.50@$3.00

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

⅜ ⅛..... 13½@14¢
No. 1..... 11¾@12½¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.

f.o.b. New York.

In barrels, ₩ ℔.....4¢
In smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.

No charge for package.
3 bbls., about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔.....4¢
5% dis.

Yager's Soldering Salts.

½-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter..... .....4¼¢@4½¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔.....21¾¢
Straits, pigs, ₩ ℔..... 21¢
Straits in bars, ₩ ℔.....22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20... $7.00
Alderly, extra quality, IC, 14 x 20...6.87½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.50
Atlantic, IC, 14 x 20..... 5.75
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 11 x 20..... 5.50
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
Dane, IC, 14 x 20..... 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 .....12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20 .....6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.25
Fort Pitt, IC, 20 x 28 ....11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20... 6.25
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20 ..... 6.75
" IX, 14 x 20 ..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20 ..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20 ..... 7.00
Maple, IC, 14 x 20 ..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20 ..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... .....12.00
" IX, 20 x 28.....15.00
Newcastle Real Old Method, IC, 14x20, 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20 .... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20..... 5.25
Palacio, IC, 14 x 20..... 5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 8.00
Phœnix, IC, 14 x 20..... 5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Tayu Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20 ....5.37½
Vigilant, IC, 14 x 20 ....5.50
Waldo Redipped, IC, 14 x 20..... 6.75
Westmoreland, IC, 14 x 20 ..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... .....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.50
Florence, IC, 14x20..... 6.75
Hazet, IC, 14x20..... 5.80
Iowa, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merlon, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" " IX, 14 x 20.. .. 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" " IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 9.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20 ..... 7.00
U. S.. IC, 14x20 .... 7.25
Versailles, IC, 14 x 20 ....5.75
Youghiogheny, IC, 14 x 20... .....6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 11 x 20.....$7 50
20 x 28..... 15.00
IX, 11 x 20 .... 8.75
20 x 28 .....17 50
Pontymister Grade, IC, 14 x 20 .... 6 50
20 x 28.....13.00
IX, 14 x 20. .. 7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20..... 5.75
20 x 28..... 11.50
IX, 14 x 20..... 6 75
20 x 28..... 13.50
Dean Grade.—IC, 14 x 20..... $5.37½
20 x 28..... 10.70
IX, 14 x 20..... 6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20..... 5.25
20 x 28.....10 50
IX, 14 x 20..... 6.40
20 x 28.....12.80

Imported Bright Plates

Charcoal.

Duty: 2.2¢ ₩ ℔.

Melyn and Cal-land Grade.	IC, 10 x 14	$6.37½
" "	IC, 12 x 12	6.62½
" "	IC, 14 x 20	6.87½
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.87½
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
"	DC, 12½ x 17	5.50
"	" DX, 12½ x 17	6.50

Coke.

Steel Coke.—IC, 10x14, 14x20$5.25@$5.35
10x20..... 8.12½
20x28..... 11.00
IX, 10x14, 14x20..... 6.60
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plates

IXX, 14x20..(112 sheets).....$13.35
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper..... . ..net

Tubing—

Tin..... 55¢
Galvanized..... 55¢

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 4¾¢
Per ℔ ....5¼¢

It Is Reported—

That Sabine & Harvey of Boonville, N. Y., will soon remove their Hardware business to Utica.

That the Warner Hardware Company, Freeport, Ill., has been incorporated. The capital stock is $20,000. The incorporators are L. A. Warner, Geo. W. Warner and Emil A. Hoofer.

That Mr. Spettigue will soon open a new Hardware store at Honesdale, Pa.

That the G. B. Churchill Company has been formed at Galesburg, Ill., with a capital stock of $20,000. They will do a general Hardware business. The incorporators are George B. Churchill, George Churchill and M. L. Churchill.

That the Hardware store of A. S. & A. E. Cooley, Canandaigna, N. Y., will hereafter be conducted under the style of Cooley & Co., Mrs. James S. Cooley having purchased the interest in the business lately owned by A. S. Cooley.

That the Wright Bros. Hardware Company, Doniphan, Mo., have been incorporated. The capital is $10,000.

That the wholesale Hardware establishment of Sickels, Preston & Nutting, Davenport, Iowa, was burglarized on the 12th inst.

That Frederickson & Reitzel's Hardware store, at White Hall, Wis., was destroyed by fire on the 12th inst.

That the Foster Hardware Company have been organized at Huntington, W. Va., with a capital stock of $50,000. The incorporators are B. W. Foster, Charles Fussell, L. M. Sanford and D. E. Abbott of Huntington, and John Russell of Ashland, Ky.

That W. P. Lett has succeeded Stewart & Lett in the Hardware business at Riverside, Cal.

That Jansen Bros., Hardware dealers, Ritzville, Wash., have sold out to H. T. Jansen.

That Chas. L. Grace is now carrying on the Hardware business formerly conducted by S. C. Summers & Co., Stanton, Mich.

That Hackett & Hebard's stock of Hardware, Stoves, Guns, Implements, &c., was destroyed in a large fire in Augusta, Wis., on the 16th inst. The loss is estimated at $6500.

That H. D. Sheets, Lewis, Iowa, has put in a stock of Shelf Hardware in connection with his harness shop.

That the Hardware business formerly conducted by Sheldon Bliss, Constantine, Mich., will hereafter be carried on under the style of Bliss Hardware Company, with Arthur Bliss as manager.

That S. A. Maley has sold his interest in the new Hardware store at Rhodes, Iowa, to F. L. Mackey.

That Orr Bros., Murra, Iowa, have just completed an addition to their Hardware store.

That Owings & Stevens, Darlington, Mo., have purchased a two-thirds interest in the Hardware business formerly conducted by Adkisson, Bentley & Co., C. T. Adkisson retiring from the firm.

That the Gorham-Aid Hardware Company, West Plains, Mo., will build an addition to their establishment.

That the Hardware firm of Williams & Sumner, Bayard, Iowa, have dissolved partnership. Mr. Williams has taken the Hardware stock and Mr. Sumner the stock of harness.

That J. W. Delano, Red Wing, Minn., has sold his Hardware store to A. J. Meacham and Frank Meacham, who will take possession about the middle of April.

That Charles Stuart has purchased a half interest in the Hardware store of A. D. Barker, Grand Blanc, Mich., and will enter into partnership with him April 1. The business will be carried on under the style of Barker & Co.

That the firm of Anderson & Forton, Hardware merchants, Stoughton, Wis., has been dissolved by the retirement of O. O. Forton. The business will be continued by Mr. Anderson.

That the La Conner Hardware Company, La Conner, Wash., have dissolved, T. S. Hurd retiring and T. R. Hayton and A. I. Dunlap continuing under the firm name of Hayton & Dunlap.

That John Taylor's interest in the Hardware firm of Lefurge & Taylor, Ypsilanti, Mich., has been purchased by T. J. Green. The firm style will hereafter be Lefurge & Green.

That S. M. Scribner of Melrose, Mass., has purchased Mr. Burrell's interest in the Hardware business of Burrell & Swett, and the business will hereafter be conducted under the style of Swett & Scribner.

That the Hardware firm of Burget & Lewis, Great Barrington, Mass., have been converted into a corporation under the style of the Burget & Lewis Company. Mr. Lewis is president of the company and Mr. Burget is treasurer and manager. The capital of the company is $10,000.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, April 7, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....812 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Galvanized Sheet Iron.

We commend to the attention of those of our readers who are interested in buying and selling galvanized sheet iron a table of net prices published upon another page of this issue. It is known that the standard gauge for sheet iron was changed last year by act of Congress, and on the first of last July the revision came into effect. The new gauges are based on weights per square foot in ounces avoirdupois, varying by even or half ounces. Galvanized sheet iron is likewise gauged by weight, the black iron gange being used as a basis and 2½ ounces per square foot added for the corresponding galvanized sheet iron numbers. In the list presented elsewhere the discounts range from 65 per cent., which is below present prices, to 85 per cent., which is much above the present discount. The table covers all the gauges in common use —that is, starting with 10, 12, 14, 16 and 18, then by single numbers to and including No. 30. Referring to the page containing this table, it will be noticed that the top line gives the list price per pound, then ounces per square foot, next the decimal equivalents in pounds per square foot, and the fourth line, in heavier type, is the list price per square foot. Below are given the discounts, the prices being in cents. For each discount net prices are worked out per pound and per square foot for all the above mentioned gauge numbers. To facilitate reference heavy faced type is used for the per square foot discounts. Twenty-five discounts are given in all, so there are prices for variations of less than 1 per cent. in the discount.

Evening Classes.

As the season of evening class instruction draws to a close there must come to many a young man who has profited by it a clearer realization of his opportunity in life. He will see that what he is and what he may be depends almost entirely upon his own exertions. He appreciates more fully than ever before not only the pleasure of possessing knowledge, but perhaps even now has learned how it profiteth a man to be wise. But a man can no more acquire knowledge by a mere receptive process without exertion of his own than he can gain strength without exercise. Thanks to the generosity and the foresight of individuals and various organizations, there can now be obtained in almost any town or city of moderate size evening class instruction in at least the rudiments of an education, and that without expense to the pupil, while in the larger cities free courses may be attended in drawing, the higher mathematics, manual training and designing, and such other instruction may be obtained as will thoroughly equip an ordinary mechanic for a responsible position. Doubtless many a draftsman or head designer can trace his progress back to a humble beginning in an evening drawing class. But even this general instruction is being supplemented by more detailed courses in certain departments, either in day or evening classes. Such, for instance, is the proposed course in sheet metal pattern cutting at the Pratt Institute, Brooklyn, of special interest to the readers of this paper, in which it has already been announced. To a young man who has his evenings to himself there can be no reasonable excuse if he lacks a fair rudimentary education. It all depends upon his own determination and persistency.

Self-Education.

Even to the young man deprived of the advantages of evening class instruction there is still an opportunity to perfect himself by home study. True it is that such study is difficult, progress is far less rapid and there is much more excuse for failure than is the case when the student is subject to the encouraging influence of others studying with him under competent instruction. But on the other hand, once mastered, the subject is his by right of conquest who wins single handed. It is impressed on his mind as it could never be had the struggle been less severe. Success in home study is, to a large degree, measured by regularity and method in all that is done. One hardly appreciates the loss (if such it can be considered) of giving half an hour a day to study, and yet in a year—Sundays and holidays excepted —this foots up the equivalent of about 20 days of eight hours each. Enough time, it is evident, if taken in the aggregate to very considerably increase one's store of knowledge. It is related that John Tyndal's success began with his determination to devote all of his spare time to study, and so earnest was he in this effort that he arose for this purpose at five on the morning of the first day after he made this resolve and continued so to do for many years. One of the benefits of home study lies in the fact that it is generally impossible to proceed to more advanced study until that in hand has been mastered, so that there is a continued incentive to perfection in each day's work. Above all things the course of study should be clearly mapped out and persisted in. There should be no cursory reading, no skipping or slighting because the matter is not clear. There likewise should be no attempt to begin the course with studies too advanced. Arithmetic must be fully comprehended before algebra is attempted, geometry should be at least reasonably well understood before a course in drawing is entered upon, and to those who desire to study the languages English grammar is a first requisite. Books can be purchased at reasonable rates, and but few are required at a time by the home student, so that the real expense of his study need not be great.

Instruction by Correspondence.

As something between the evening class instruction and unaided individual home study there are gradually arising correspondence schools and courses of study conducted entirely by correspondence. The remarkable success of the Chautauqua circle in a line and by a method somewhat similar is evidence of the possibilities of an extension of the method. University extension is destined to do much along the higher lines of study, while less pretentious courses are likely to be presented to the mechanic and the artisan. Such a plan is that of the Correspondence School of Mechanics, which furnishes text books of its own preparation, conducts the instruction by mail and awards a diploma or certificate upon passage of the requisite examinations. While it is extremely difficult for a student under such a method to properly present in writing to the instructor the points that puzzle him, and perhaps as hard for him to understand the explanation that is written in reply, nevertheless there is, 1, a direct benefit in the necessity of clearly stating upon paper the existing difficulty ; 2, a consequent indirect instruction in English composition ; and, 3, an advantage in having the instructor's reply permanently recorded where it can be read and reread until the meaning is clear. Of course, such instruction by correspondence cannot be furnished without charge, but in the case of such schools or courses as are already in operation the expense

is by no means excessive. In fact, the cost of an education by any one of the three methods here presented should not, and to a determined young man will not, be a serious hindrance. If he is sufficiently resolute to attempt and persist in a course of study he will somehow, even by serious self denial in other things, set aside the means to accomplish the end he has in view. He will make of himself a better, a nobler, a wiser and a more capable man.

Not the Time for Strikes.

As mild weather resumes its sway, says *The Iron Age*, the strike season begins. It was much to hope that the bitter period of adversity through which the country passed last summer had permanently changed the attitude of labor leaders and implanted among their followers a spirit of quiet resignation to untoward circumstances. When factories were shut down on every side and thousands of willing workers were thrown out of employment in every manufacturing center, reductions in wages were accepted almost without a murmur by even the craftsmen who are ordinarily the most turbulent and uncontrollable. The times were then not only bad, but every one feared that they might be worse, and, besides, winter was at hand with its necessity for warm clothing, extra fuel and good food. Now, however, the chill winds have about ended, and with the advent of spring work is naturally much more plentiful. The prospect is not so cheerless as it was last fall. Therefore, latent discontent with reduced wage scales is beginning to crop out, and strikes are making their appearance in various localities and in different trades. It is a most unfortunate time for such troubles, as there has not been a sufficient revival in business to justify advances in wages, and in addition to this every strike now cuts down the purchasing power of the people, which needs to be kept up and built up as much as possible so as to help general business to emerge from the mire in which it has so long been floundering. Labor agitators who would precipitate trouble at a time like this are totally bereft of wisdom. But they and their following may to some extent be influenced by the false statements of reviving business which are now published for political purposes in great metropolitan journals. The newspaper which says, for instance, that the Illinois Steel Company have enough orders on hand to keep their South Chicago rail mill running night and day for two years does a very great deal toward stirring up unrest among workingmen. The statement is ridiculously incorrect, as every one connected with the iron trade knows or should know. And yet it has been copied all over the country, and has even been accepted as true by a trade journal which professes to have some connection with iron and steel interests. While we deprecate calamity howling, and believe that matters are mending instead of growing worse, yet business is in such condition that the precipitation of labor troubles on the large scale now threatened will give it a serious backset. Those who write for the public eye should confine themselves strictly to the truth. There is a serious responsibility on their shoulders.

We are informed that applications for sheet metal pattern cutting instruction have been coming in to Professor Richards, director of the Trade School of the Pratt Institute, Brooklyn, quite freely. If the number of candidates increases at all between now and next September, the starting of a class during the latter month will be assured.

Williamson Trade School.

The first commencement of the Williamson Free School of Mechanical Trades, Elwyn, Delaware County, Pa., was held on Monday, April 2, when diplomas were awarded to 46 graduates. The trades taught at the school, namely, bricklaying and plastering, carpentry, machine work, and pattern making, each contributed about an equal number of students to the total number graduating. The students were addressed by Governor Pattison of Pennsylvania, Mayor Stuart of Philadelphia, Hon. John Wanamaker, and other notabilities. President Schrigley of the school gave a very encouraging account of its progress and utility. All the buildings have now been completed and equipped, and yet there are now more available funds in the treasury of the school than there were at starting. The average age of the graduates was 19½ years.

News and Notes.

Governor Flower has signed a bill passed by the New York Legislature prohibiting the erection of bank buildings at a greater cost than 25 per cent. of the net surplus of the institution.

New Hampshire advices report a poor maple sugar crop.

Over 3000 applications are said to have been received for the prize of $50,000 offered by the Metropolitan Traction Company of New York for a system of street railroad power superior to the overhead trolley system and equally cheap of operation.

The decline of agriculture in England is becoming a serious question. Every year sees more and more land going out of cultivation. The decrease last year was 176,000 acres, and during the last 20 years nearly 2,000,000 acres have been abandoned.

The city of Detroit is to do its own lighting.

The *Journal of Railway Appliances* is of the opinion that iron car construction has taken permanent root in this country.

The River and Harbor bill which was reported to the House last week carries an appropriation for the fiscal year ending 1895 of about $9,500,000, which is $12,000,000 less than that for the current fiscal year and $30,000,000 less than the estimates submitted by the Government engineers.

Of the 55,768,000 bushels of grain exported from the port of New York during the year 1893, not one bushel was carried in an American vessel. The grain carrying trade is exclusively in the hands of foreigners.

A reorganization committee for the Atchison Railroad is in process of formation.

The battle ships "Iowa" and "Brooklyn," now under construction at the Cramps' shipyard, Philadelphia, will be ready for launching in the fall.

The statement that the Pennsylvania Railroad Company is interested in the North River Bridge project, to connect New York and Jersey City, is officially denied. One of the principal Pennsylvania officials is quoted as saying that when the road enters New York it will be underground, not overhead.

Views of a Welsh Tin Plate Manufacturer.

E. R. Daniel, a Welsh tin plate manufacturer, has recently returned home from a business visit to the United States. His observations while in this country have led him to the conviction that the Wilson bill will pass the Senate in the same form in which it passed the House of Representatives, and that afterward the Welsh tin plate industry will revive and the American will languish. The grounds for this confidence he gives in an interesting interview lately published in the *Western Mail* of Cardiff. Assuming that a $1\frac{2}{10}$ cents duty is to be imposed, he remarks as follows: "There is no doubt in my mind that when it does the Americans will not be able to compete with us in the manufacture of tin plates. They don't economize in material so carefully as we do, and so they can't put the finish on the article for our price, especially at the high wage rates prevailing. I called at a little place near Pittsburgh where they were turning out 4500 boxes of plates weekly, 1500 of which they coated there and the rest sent elsewhere. I got it from the owners themselves that they would not be able to make tin plates profitably if the Wilson bill passed. And so at Taylor's works, Philadelphia, and other places. There seemed to be but one opinion on the point, and that the same as I have stated." Being asked whether there really are tin plate works to be found in America, Mr. Daniel replied: "Oh! yes, a few; and one or two very good ones, I can tell you." The trade in this country he reports to be as bad as bad can be. In metals he found no stocks anywhere; every one working their last pound, and only buying from hand to mouth. From this he infers that in a couple of months after the passage of the tariff bill better things will be seen in Wales.. "Consumption out there," said he, "has not ceased, yet our Welsh works have been idle. The canning season will be upon them directly, and what are they to do but take our plates?

"And another thing," said Mr. Daniel in conclusion, "the Americans, you know, have been exporting very much more than they have been importing of late, and they can afford to send us a few orders without injuring their balance of trade."

Dispatches from all parts of the country indicate that the severe cold of the last few days has done great damage to budding fruit trees and growing crops.

THE LETTER BOX.

Loss of Steam Pressure.

From H. B. C., *St. Louis*.—In our plant here we have two boilers, capacity 30 and 60 horse-power, with 4-inch main reduced to 3 inch, running about 100 feet and tapped by ¾ inch pipes running to our jacket kettles. The feed pipes on the kettles are ¾ inch and the same size return. The returns empty into steam traps which stand boiler pressure. We have steam gauges on our kettles, and while our steam gauge on our boiler shows a pressure of 80 pounds and on the main 2 feet from the kettles shows 75 pounds, the gauge on the kettles shows but 20 pounds. We have examined the pipes and know they are perfectly clear, and do not understand why we cannot get a pressure on the kettles within a few pounds of the main. We use copper kettles, steam jacketed, with a capacity of from 1 to 4 barrels. We have had some of our steam experts here pass on the matter, and they do not seem to understand why we cannot get the pressure, so we concluded to submit the problem to *The Metal Worker* and its readers for solution. We would state that in our other factory, from which we recently moved, our main was a 2-inch one from 80 horse-power boilers, and the gauge on our kettles showed but 10 pounds lower pressure than the gauge on our boilers. All our kettles are within 2 feet on the main and the valves are all new Jenkins valves, and there is no leak that we can see in any way in the main.

Note.—This problem should elicit some interesting opinions from our readers. The trouble is probably due to some defect in the system which has been overlooked. A number of experts have been consulted and none can give a satisfactory explanation, but all agree that there is something that has been overlooked which an experienced man would soon detect. The employment of such a man will be the best way to secure service, and in the mean time some suggestions may be received. We hope our correspondent will describe what caused the trouble when it is found.

A Question in Lead Burning.

From H. D. T., *Scranton, Pa.*—Please inform me through *The Metal Worker* what acid or preparation it is that is sometimes used in lead burning.

Answer.—Speaking of acids in connection with lead burning, there comes to mind the dilute sulphuric acid that is used in generating the hydrogen gas. Our correspondent, however, evidently means something else. We have submitted this matter to H. J. Bailey, Pittsburgh, Pa., a well-known expert in lead burning, and from his reply we quote as follows: "The acid or solution that you ask about is a solution of the double chlorides of ammonia and zinc. This is the king flux solution. Some lead burners use the following solution: Into muriatic acid put shreds or clippings of sheet zinc and let stand until all bubbling ceases. Some add 1 ounce of sal ammoniac to each pound of this solution. A good lead burner, however, needs no flux. He cleans his lead edges with the shave hook and proceeds to unite or burn the edges together by means of the non-oxidizing flame. The acid he inquires about is used only where the lead burner has burnt the lead by the oxidizing flame, which would not have happened if he had understood the nature of the flame he was working with."

Rosining Roof Seams.

From J. J., *Hohokus, N. J.*—Seeing the different letters in *The Metal Worker* about roofing, I contribute a description

Rosining Roof Seams.

and a sketch of an apparatus and method I use in rosining seams for flat seam roofing. After the seams are all flattened down with the mallet, I take the fine rosin which accumulates in the barrel and put it in a funnel shaped device with a handle of 1¼-inch iron and about 2 feet long and spread it on the seams. The funnel part is about 4 inches in diameter at the large end and $\frac{3}{16}$ inch at the bottom, and is about 6 inches long. When this is filled with rosin I put the end with the small hole on the edge of the seam and run a hot copper into the fine rosin, which melts it, and it runs out as the device is drawn along the seam, leaving the seam all ready for the application of the hot copper and solder.

Trouble With Solder.

From A. D. E., *New York*.—Having experienced some trouble in getting a good wiping solder, I bought some tin and lead from a house that is reliable in furnishing pure articles, and mixed 4 pounds of tin and 6 pounds of lead and made up 100 pounds of solder. With this solder, try as I may, I cannot get a bright joint, no matter how hot the solder or how quick I wipe it. Will you kindly answer me through *The Metal Worker* if there is a certain brand of tin or lead required to make bright wiped joints?

Answer.—We think our correspondent's trouble is due to some impurity rather than to the brand of goods used. Some plumbers always use Banca tin and are careful to get pure lead, never using new or old lead pipe, though sheet lead is not objected to. By sprinkling sulphur over a pot of solder heated red hot and stirring it in thoroughly the solder can be cleaned and then tried on a joint, when if it turns out bright a sufficient proof may be had of the impurity. Then by adding the tin and good sheet lead the metals causing the trouble can be discovered.

Poportions of Fire Places.

From F. A. F., *Helena, Mont.*—Will some one please give me, through the columns of the paper, the proper depth and hight for fire places in which andirons are to be employed? I desire to know what should be the depth and hight of fire places 3 feet wide, 3 feet 6 inches wide, 4 feet wide, 4 feet 6 inches wide and 5 feet wide. There are very few fire places in this town which give satisfaction, as most of them smoke, and I think the fault is in the depth and hight of the fire place when compared with its width.

Note.—We referred the above inquiry to one of the leading grate manufacturers in this city, who furnishes the following touching the points raised by our correspondent: The proper dimensions of a fire place depend upon the size of the flue and its form. Usually the fire place is made 30 inches wide, 30 inches high and 12 inches deep, in connection with a flue 8 x 8 inches. A safe rule for regulating the size of the flue in its relation to the fire place is to make its area one-eighth that of the product of the width and hight of the fire place in inches. Thus a fire place 4 feet wide by 4 feet high, giving an area of 2304 inches, should have a flue area of 288 inches, or about 17 inches square. This, however, is only a general rule, applicable more particularly to high fire place openings. Smaller fire places, as the 30 x 30 inches, will work well with a flue area less than one-tenth of the area of the fire place opening. A matter not less important than the size of the flue is its shape where it joins the fire place. No flue is a good one which does not slope at an angle of 45° from the horizontal line. While the smoke is hot it should reach the narrowest or smallest part of the flue, and that point should not be over 20 to 24 inches above the top of the fire place. There would be few complaints of smoky fire places if builders gave proper regard to the shape of

the flues, and never was this caution more necessary than it is at present, when corner fire places are so much in vogue. Some masons think that if they make a flue very large all danger of bad draft may be avoided, but this is a great error. There is as great danger in making a flue too large as in making it too small. A flue should be no larger than is necessary to carry off the greatest volume of smoke that is made by the fire. If larger, eddies or counter currents are formed which greatly impair the draft.

The Capable Man.

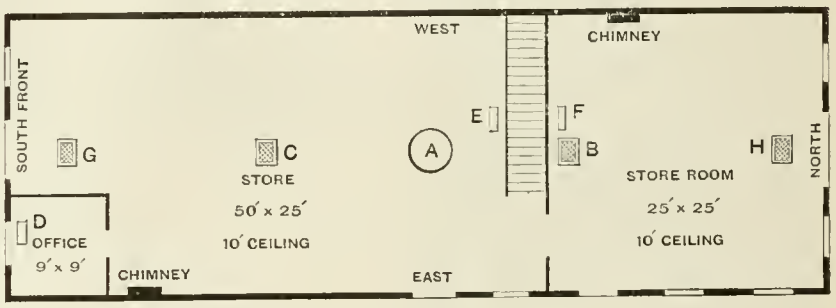
From MECHANIC.—In an article in *The Metal Worker* of March 10, page 27, which was reprinted from the *Clay Worker*, I think some erroneous statements were made respecting a capable man being seldom out of a job even in hard times. I have worked in several shops, and talked with a great many in different callings who have worked under various foremen, and all the evidence I can get goes to show that the survival of the fittest is not the rule, but rather the second or third beat retain their positions. The average foreman is afraid to keep a man who is competent or perhaps a better mechanic than himself for fear of losing his position, while by keeping the second-class man who is not able to turn out so much or so fine work, he renders his position more secure. His star appears all the brighter when viewed from the manager's office from the mere fact of being surrounded by such dim lights. I will warrant that many readers of your paper have left good positions simply because the foreman did not feel at ease when they were working, and so took the first opportunity to have them dispensed with. Any person who has read history knows perfectly well that it was not the best man who occupied positions of trust in all cases. In many instances a good man may get a fair start, but just so soon as he begins to crowd those at the top, off goes his head. If the manager will send some one around among the men, now and then, to find out what the mechanics think, men would remain longer in the same shop. Another test is to give the foreman an extra difficult piece of work, then watch and see if he gives it to the man who keeps steadily employed or to the man whom he lays off. It always seemed strange to me to see the foreman give one man first class work to do during the busy season and another nothing but common work (who couldn't do a smooth job to save his life), but as soon as trade slackened the good mechanic was laid off.

Note.—We print our correspondent's letter, not because we agree with him, but simply to illustrate the feeling of a certain class of men. While all that he says is true in some and perhaps many cases, it is not the universal rule. There are many small minded, jealous foremen, undoubtedly, but we believe that there are more foremen who are superior to these petty notions. Very often a first-class workman fails to keep a steady job, simply by reason of some personal peculiarity—an offensive manner, or a spirit of criticism, or some trick or other that makes him a disagreeable companion, though his work may not have any defect. We suggest to our correspondent that he bear this fact in mind as a possible explanation of some of the cases where a competent man is laid off and not ascribe it entirely to the foreman's jealousy.

Wants Suggestions on Heating.

From J. P., *Millbrook, N. Y.*—I have a 271 Fuller & Warren Company combination warm air and hot water heater, which I want to use to heat the store shown by the plan and would like suggestions on putting it in so as to use both kinds of heat successfully. It is a two story brick building, to be used as a hardware store, and I want to heat the first floor comfortably, and the second floor, which is all in one room, I only want to take the chill off. The office partition is only 6 feet high and the ceilings are 10 feet. There is a cellar under the whole building. Where should the heater be set and where should the registers and radiators be placed?

Note.—No doubt different opinions exist as to what is best in this case, and we hope they will be expressed in *The Metal Worker*. A good location for the heater will be 6 feet south of the stairs, at the center of the building, at A. A 14-inch pipe should be run to a 14 x 20 register, at B, in the back storeroom, and a 16 inch pipe should run 10 feet toward the front of the store, to a 16 x 20 register, at C. A 1-inch pipe should be run to a radiator containing 40 square feet of surface, at D, and a 1¼-inch pipe should be run to a point below the radiator E, located near the stairs on the upper floor. At this point a 1¼ inch riser should be taken to the radiator, and the main reduced to 1¼ inch and continued until it rises to the radiator, at F, on the other side of the stairs on the second floor. The second story has 18,750 cubic feet of space, and as a moderate temperature will be satisfactory if 1 square foot of surface is used for every 90 cubic feet of space, 100 square feet of surface exposed in each of the radiators will be ample. The returns from the radiators should be run the same as the flow pipes and should connect at the return in the heater. All of the water pipes should have a pitch from the heater, without any dips, to secure a good flow through the system. All the radiators should have air valves at the top. An expansion tank should be located near the ceiling on the second floor and be connected by a 1-inch pipe with the return pipe in the basement at the most convenient point. As the store will probably have a sufficient change of air through the opening and closing of the doors, the furnace may take its supply from the basement, if it is kept clean, and a circulation can be kept up by placing a 14 x 20 register in the floor, at G, in the front store, and one at H in the back store. As there are two chimneys, one can be used as ventilating shaft if desired, using that having the better draft for a smoke flue.



Wants Suggestions on Heating.

Wants a Sewer Trap.

From J. L., *Danville, Pa.*—Please give me some information in *The Metal Worker* about the trapping of sewers in city outlets. We have an 18-inch terra cotta sewer here and have taken several 15-inch outlets for surface water at the gutters. When the water in the river gets low the end of the sewer is exposed and a disagreeable smell comes from the street outlet. I cannot get a 15 inch terra cotta trap and would like to know some method of trapping that would overcome the trouble.

Answer.—Terra cotta running traps 15 inches in diameter can be bought from several different makers, but are not carried in stock and two weeks would be required to fill an order. They are preferable to what are known as mason's traps, as they are likely to be flushed clean when the full bore of the pipe is filled with water, and consequently do not fill up with dirt so readily. If a mason's trap is to be used, some trouble should be taken in building it to have the turns easy. It consists of a chamber having dimensions twice those of the inlet and outlet in depth and length. Both the inlet and outlet should run from the side of the chamber as near the top as possible. In building the trap a stone or iron partition should extend down from the top of the chamber two or three inches below the bottom of the inlet and outlet, and should be placed across the chamber midway between the openings. The inlet may enter the top of the chamber on the inside of the partition, otherwise a manhole must be provided for cleaning. Care should be taken to have the chamber and the partition separating the two parts made air tight;

then, when water fills the lower part of the chamber and the partition extends down into it, the sewer air cannot escape to the street outlet.

Roofing Material Wanted.

From M. H. R, *Winnipeg, Manitoba.*—Your Letter Box department has solved so many practical difficulties that I venture to ask your advice with respect to roofing material suitable for this climate, which, as you are probably aware, is, on the whole, very dry, but subject to occasional wet intervals, and with a variation between lowest winter and highest summer temperature of about 150° F. (from 50° below zero to 100° in the shade). Different materials have been tried, but all are more or less defective. What seems to be wanted is some material impervious to wet, and which will not expand or contract as between hot and cold and wet and dry seasons. Ordinary tin or metal roofing expands and contracts so much that even if at first properly laid down and fitted, leak holes soon appear and give trouble, more particularly during the mild spells in winter when there is snow on the roof. I trust that some of your readers can suggest a remedy for the trouble named.

Note.—It is an interesting topic that our correspondent suggests for discussion, and we would like to have opinions from practical readers that we might print them for his assistance. Two methods of meeting the problem are either to use a metallic roof and so lay it that the great expansion and contraction will be provided for, or else make use of some material which does not vary so much between the limits of temperature mentioned. Trouble with most of the softer materials, if we may so classify them, is that they are not so enduring, as a rule, as the metallic roofs; but on the other hand, it should be borne in mind that the climate of Winnipeg is very dry and is therefore not so destructive as the climate elsewhere and near the seaboard. Our correspondent gives a limit of temperature from 50° below zero to 100° in the shade. But it must not be forgotten that the roof is exposed to the sun temperature, which, with the thermometer at 100° in the shade, would be very likely to register up to 130° or 140°.

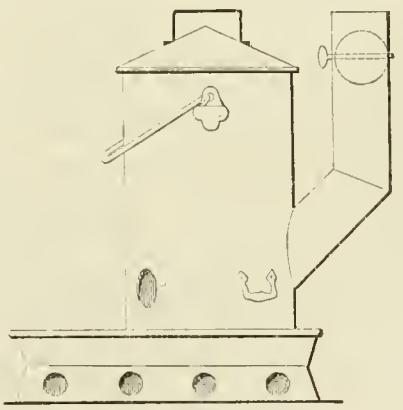
Should be Brazed.

From A TINSMITH, *New York.*—I wish to get some information through *The Metal Worker* about a job that is giving me trouble. I am putting brass blocks on steel heel plates. The plates are ground bright and I tin them thoroughly, as well as the brass blocks, and join them while they are hot by holding over a fire, but when they cool they come apart and all of the solder is on the brass block and the steel plate is as clean as it was before I tinned it. I use half and half solder, but cannot use acid, as it would make the plates rust. The plates are well coated with solder and I would like to know why the solder does not stick and what I can use instead of acid. I have used pure block tin, but with no better success.

Answer.—If the articles are thoroughly washed in clean water after tinning there will be no acid left to produce rust, and an acid flux will secure a stronger union of the two parts and may be sufficient. If considerable strength is desired brazing will prove more satisfactory and is done by cleaning the surfaces to be united and using borax as a flux and hard solder of a composition that will melt before either of the parts are melted. Usually a red heat is required for fusing. The fusion may be effected at a lower temperature by using different alloys or proportions. One part copper and one part zinc is given by a recent book as a generally used proportion. The alloy is cast in ingots, which are heated red and hammered, and at the right temperature it will granulate in lustrous yellow particles, when it is ready to be used. A more readily fusible composition is given as 44 parts copper, 49.9 parts zinc, 3.3 parts tin and 1.2 parts lead. If the brass blocks and steel heel plates are united by these solders the trouble reported will be overcome

Roofing Fire Pots.

From J. D. G., *Boseman, Mon.*—In response to the request of "F. W. S." in *The Metal Worker*, March 3, I submit a sketch of my roofing fire pot. It is 16 inches high, 9 inches in diameter and sets on a 10 x 16 inch base 1 inch high, with a 1-inch rim around the top. The base is ventilated by several ½-inch holes around the bottom, and both it and the rim are wired to give strength. The rim is to catch the coals that are drawn out with the coppers. A 3-inch pipe connects at the bottom and runs up to the top with a damper in it. The front is lined with heavy sheet iron and is riveted around the holes. The top has a tight lift off cover.



Roofing Fire Pots.

Left Handed Tinners.

From W. S. L.—Although the question has been pretty well exhausted, I nevertheless would like to say a few words on this topic. When I was young I was very right handed, but took it into my head that it would be convenient to use both or either hand, and by some practice and perseverance I became handy with both. I had an apprentice some years ago who was left handed, and although awkward at first, in a short time he could use one hand as well as the other, which gave him an advantage in shop work. I believe it would be a benefit to a great many men if when young they were trained to use both the hands at all kinds of work. There might be an exercise in the schools for the purpose of training in the use of both hands, if only for half an hour a day.

Small Air Bound Pipes.

From HELIOS. — Referring to the letter of "E. J. S.," page 30 of *The Metal Worker* of March 17, will say that if "E. J. S." will take a ½-inch pipe connection from the horizontal pipe over the door and run it up and over the tank on the second floor, leaving the end open, all the air can pass out when the boiler is filled with water. If the water in the boiler at any time should reach the boiling point, all the steam will escape from the pipe over the tank. This connection will stop all the rumbling noise and allow a free circulation of the water. Would advise taking out all the ½-inch pipe and make it ¾ inch inside diameter with a ½ inch air pipe over tank.

Hot Water from Cold Faucet.

From HELIOS.—Referring to the letter of "L. J. P.," page 32 of *The Metal Worker* of March 17, will say that by placing a swing check valve in horizontal cold water pipe over the boiler, with the valve set to close when the faucet is opened over the sink, it will stop the hot water from leaving the boiler through the cold water pipe. If a check valve is placed in the cold water supply pipe to a boiler, there will have to be connected to the hot water pipe a water relief valve. The waste from the relief valve can be connected and discharged over the sink. There will also have to be placed on the boiler a vacuum valve to allow the air to enter the boiler and prevent the collapsing of the boiler.

Miter Patterns.

From SUBSCRIBER.—I would like to be informed how to obtain the patterns for a square return miter, an octagonal miter, and for a butt miter against a curved surface.

Answer.—Referring to "The Metal Worker Pattern Book," the answer to the first question can be found on page 153, to the second on page 211, and to the third on page 155.

Cleaning Zinc.

From T. G. S., *Genoa, Ill.*—Will *The Metal Worker* or some of its readers give me a receipt for cleaning and polishing zinc?

Answer.—A well-known receipt book says zinc is generally mechanically pickled by scouring with sand and powdered pumice. The bath used for brass is also very effectual; it is composed of one part of ordinary nitric acid and one part of sulphuric acid and must be washed off with clean water. To larger articles which cannot be dipped in the bath of acid and water apply a solution of potassium-ammonium tartrate thickened with sufficient clay to form a fluid paste. After a few hours rub the article with a brush dipped occasionally into fine sand moistened with the pickle, then polish with powdered charcoal or Vienna lime.

Fuel for Furnaces.

From FURNACE DOCTOR, *Rochester, N. Y.*—The high price of fuel makes every one desirious of using that which is cheapest. After 15 consecutive years' experience in caring for furnaces, sometimes as many as 20 at a time, I feel that I am in position to express an opinion on the relative values of different kinds of fuel. To heat a house cheaply the furnace should be very large in proportion to the size of the house to be warmed. It should be filled with fuel and the draft closed, thereby insuring more nearly perfect combustion. In giving my opinion about fuels I will first relate my individual experience. The house in which I live is a new one, built three years ago, two stories, brick, three rooms and hall below and three rooms and bathroom above. The first winter I used gas coke for heating with a furnace of ample size. I paid 5½ cents per bushel for coke, and it took 250 bushels to carry me through the season, costing $28.60 in all. Coal at the time was $4.50 a ton, and as I afterward learned it would have required 9 tons, which would have amounted to $40.50, making a saving of $11.90 for that year. The next winter I used the same amount, 250 bushels, at a cost of $37.40, the price being raised twice. The price of coal that year was $5 a ton, which for 9 tons would have amounted to $45. Again, you see, I made a liberal saving. The present winter gas coke has been 8 cents per bushel and so last fall I decided to try coal at $5 a ton. Before the season closes I shall have used just about 9 tons. By using coke at 8 cents a bushel there would have been a slight saving in money and I would have had much more satisfactory results so far as heating is concerned, for, on account of a weak draft in the chimney, the coal takes a long time to get burning, while coke burns up readily, and when the draft is closed it holds the fire well.

In addition to my own experience I have a good deal to do with other houses, of which I will send some account. In large houses I burn from 15 to 17 tons of coal a season, and I find that the Pennsylvania coke, prepared expressly for fuel, shipped to this market, and sold at present at $4 a ton (coal now being $4 25) would do a little more work, or, rather, last a trifle longer, ton for ton, and at the same time make a vastly better fire than coal. As I am not in the interest of any coal dealer, but work for the interests of my patrons, I always advise them to use coke, and it has been the means of saving them many dollars. Three winters ago I was called to take care of a steam heater in the residence of a physician, who had been using coal at the rate of 2 tons in about 25 days. When I took the furnace the coal bin had just been filled up, and my experience was about the same. I then advised the use of Pennsylvania coke, and the result was, at $1.25 per ton less cost than coal, it lasted about three times longer. From that day to the present I have used no more coal in that furnace. As spring comes on and the weather gets warmer I have used gas coke and find for a very low pressure of steam that it has been a still further saving. Just at present I am using a small sized Pennsylvania coke, and find for raising steam it equals gas coke in economy. I will give a third example to illustrate what has been my experience. For the past eight years I have had charge of a furnace which uses 17 tons of coal per season. After a while I said to the householder that coal was dear, and advised the use of coke. I put in 200 bushels of gas coke at 6½ cents a bushel, making $13, which lasted until nearly Christmas. Then 7 tons of Pennsylvania coke at $3.75 a ton, amounting to $26 25. When that was used up mild weather had again arrived, and 100 bushels of gas coke, costing $6 50, carried the furnace through the season, the total cost being $45.75, against 17 tons of coal, which would have cost at $5 a ton $85, thus saving $39.25. I have used coke in that furnace ever since. I am just now taking care of 12 furnaces, and in only three am I using coal. To summarize very briefly, I find coke as a fuel for heating to be much the cheaper when used judiciously. In mild weather use gas coke, and in more severe weather Pennsylvania coke.

Note.—This letter from our correspondent is particularly interesting, as it deals with a very important matter—namely, the cost of fuel for warming houses. We wish our readers would take this occasion to tell us what experience they may have had with other fuel in comparison with coal.

Will Syphon Work?

From P. & L., *Woodstown, N. J.*—Wishing to syphon water out of a well 20 feet deep, would like to know from *The Metal Worker* or its readers if a ¾ inch pipe about 200 feet long will do the work, or will a larger pipe be necessary? The fall is sufficient and the length is mentioned that the conditions may be understood. The water is to be carried down a hill from a barn.

Note.—In *The Metal Worker* a few years back a correspondent stated that he had laid 1540 feet of 1-inch galvanized iron pipe from a brook to a tank, over a hill 29 feet high, and was able to fill the tank, which held 1200 gallons, in four hours. This will give our correspondent some practical information, but we should be glad to hear from others on the subject.

Swelled Boiler Piping.

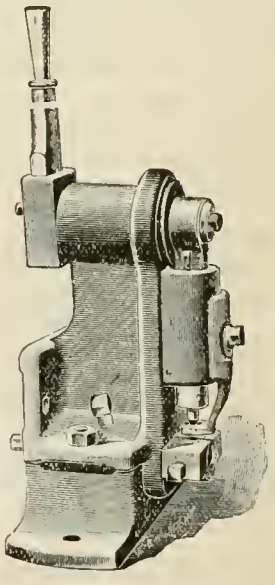
From E. H., *Nyack.*—A number of years ago I was called upon to repair the hot water pipe from a water back to a boiler. I found the boiler to have an open top with loose cover. Into this boiler the water was pumped as it became empty. The pipe close to the joint where the heavy lead pipe was wiped on the brass nipple at the side of the boiler was swelled to fully double the size of the other pipe, and had opened just enough to make a very small leak. The owner told me it had done so before, and wished me to make a new joint. I accordingly repaired it, but suggested that probably only an iron pipe would be a permanent remedy. About two weeks after I was called to replace the lead pipe with iron, as it had again given out. It has now been in use about five years with no further trouble. I would like to know if this is a common occurrence with such boilers, or is it owing to some local circumstance in this case?

Last fall I was called for the first time to a boiler which was supplied by pressure, not very heavy. In this case the lead pipe from water back to boiler had been swelled out of all proportion and been repeatedly mended next to the water back connection. It was leaking and I mended it as it had been mended before. In this case the break was through the solder, which seemed to have been almost as thick as the pipe. In a few weeks' time I replaced this with iron pipe, as another leak showed itself. We have had no further trouble. One more case was somewhat similar, only in this the pipe gave out next the boiler, and after several times repairing I substituted iron pipe, which remedied the difficulty. These troubles all doubtless arise from imperfect circulation, but why should they act so differently? I thought it might come from the boiler tube being so short that the cold water is discharged so close to the inlet for hot water as to cause it to damage this pipe every time. If such is the fact it becomes a very important matter to see that this tube extends well toward the bottom of the boiler.

Answer.—The swelling of the return pipe to the boiler is a quite common occurrence, and happens when the water back has a large heating capacity and when the water pressure is very light, as is stated in the cases reported. It is not due to the tube in the boiler or any unusual local condition. In *The Metal Worker*, March 17, an illustration and explanation of the trouble is given in the article entitled "Water Hammer and Boiler Connections."

Hand Power Scroll Punch

This tool, made by the W. & S. Hydraulic Machinery Works, 204 East Forty-third street, New York, is designed for the use of those who have to punch holes through small scroll bends. In order to obtain the greatest stiffness with small size the dies are located in the ends of a tool steel bar passing through the body of the machine. The bar is 1 inch in diameter at one end and is flattened to a larger circle at the other, and the centers of the dies are ⅝ inch from the end of the bar. A small table for punching flat iron is shown in position attached to die bar. The punch, as shown, is to be bolted down to the bench, but it can be detached and bolted to a post if desired. There is also a special projection for holding it in a vise. The lever is easily removed, as it slips into a socket, as shown. The tool and stand weigh 60 pounds.



Hand Power Scroll Punch.

NET PRICE OF GALVANIZED SHEET IRON.

The table printed below gives the net price of Galvanized Sheet Iron of the gauges in common use at discounts from 65 per cent. to 85 per cent. from the present list. The gauges, based on weights, are according to the United States standard which came into effect July 1, 1893, the galvanized sheets being 2½ oz. per square foot heavier than the black iron of the same number.

No.		10	12	14	16	18	19	20	21	22	23	24	25	26	27	28	29	30
List price per lb.		12c.	12c.	12c.	12c.	13c.	13c.	13c.	13c.	14c.	14c.	14c.	15c.	15c.	16c.	17c.	19c.	21c.
Ounces per sq. ft.		92½	72½	52½	42½	34½	30½	26½	24½	22½	20½	18½	16½	14½	13½	12½	11½	10½
Pounds per sq. ft.		5.78	4.53	3.219	2.656	2.156	1.906	1.656	1.53	1.406	1.28	1.156	1.03	.906	.8437	.7812	.7187	.6562
List price per sq. ft.		**69.36**	**54.36**	**38.62**	**31.87**	**28.02**	**24.77**	**21.52**	**19.89**	**19.68**	**17.92**	**16.18**	**15.45**	**13.59**	**13.49**	**13.28**	**13.65**	**13.78**
DISCOUNT.		Cents.	Cents.	Cents	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents	Cents.	Cents.	Cents.	Cents.
65%	Per lb.	4.2	4.2	4.2	4.2	4.55	4.55	4.55	4.55	4.9	4.9	4.9	5.25	5.25	5.6	5.95	6.65	7.35
	" sq. ft.	**24.27**	**19.02**	**13.52**	**11.14**	**9.81**	**8.67**	**7.53**	**6.96**	**6.89**	**6.27**	**5.66**	**5.40**	**4.75**	**4.72**	**4.65**	**4.78**	**4.82**
65 & 5%	" lb.	3.99	3.99	3.99	3.99	4.32	4.32	4.32	4.32	4.65	4.65	4.65	4.98	4.98	5.32	5.65	6.31	6.98
	" sq. ft.	**23.06**	**18.07**	**12.84**	**10.59**	**9.31**	**8.23**	**7.15**	**6.61**	**6.53**	**5.95**	**5.37**	**5.13**	**4.51**	**4.49**	**4.41**	**4.53**	**4.58**
65 & 10%	" lb.	3.78	3.78	3.78	3.78	4.09	4.09	4.09	4.09	4.41	4.41	4.41	4.72	4.72	5.04	5.35	5.98	6.61
	" sq. ft.	**21.85**	**17.12**	**12.16**	**10.03**	**8.82**	**7.79**	**6.77**	**6.25**	**6.20**	**5.64**	**5.09**	**4.86**	**4.27**	**4.25**	**4.18**	**4.29**	**4.33**
67½%	" lb.	3.90	3.90	3.90	3.90	4.22	4.22	4.22	4.22	4.55	4.55	4.55	4.87	4.87	5.20	5.52	6.17	6.82
	" sq. ft.	**22.54**	**17.66**	**12.55**	**10.36**	**9.10**	**8.04**	**6.99**	**6.45**	**6.39**	**5.82**	**5.26**	**5.01**	**4.41**	**4.38**	**4.31**	**4.43**	**4.47**
67½ & 5%	" lb.	3.70	3.70	3.70	3.70	4.01	4.01	4.01	4.01	4.32	4.32	4.32	4.63	4.63	4.94	5.24	5.86	6.48
	" sq. ft.	**21.38**	**16.76**	**11.91**	**9.82**	**8.64**	**7.64**	**6.64**	**6.13**	**6.07**	**5.53**	**4.99**	**4.77**	**4.19**	**4.16**	**4.09**	**4.21**	**4.25**
67½ & 10%	" lb.	3.51	3.51	3.51	3.51	3.80	3.80	3.80	3.80	4.09	4.09	4.09	4.38	4.38	4.68	4.97	5.55	6.14
	" sq. ft.	**19.78**	**15.90**	**11.30**	**9.32**	**8.19**	**7.24**	**6.29**	**5.81**	**5.75**	**5.23**	**4.73**	**4.51**	**3.95**	**3.95**	**3.88**	**3.99**	**4.03**
70%	" lb.	3.60	3.60	3.60	3.60	3.90	3.90	3.90	3.90	4.20	4.20	4.20	4.50	4.50	4.80	5.10	5.70	6.30
	" sq. ft.	**20.81**	**16.31**	**11.59**	**9.56**	**8.41**	**7.43**	**6.46**	**5.96**	**5.90**	**5.37**	**4.85**	**4.63**	**4.07**	**4.05**	**3.98**	**4.09**	**4.13**
70 & 5%	" lb.	3.42	3.42	3.42	3.42	3.70	3.70	3.70	3.70	3.99	3.99	3.99	4.27	4.27	4.56	4.84	5.41	5.98
	" sq. ft.	**19.76**	**15.49**	**11.01**	**9.08**	**7.97**	**7.05**	**6.12**	**5.66**	**5.61**	**5.10**	**4.61**	**4.40**	**3.87**	**3.84**	**3.78**	**3.89**	**3.92**
70 & 10%	" lb.	3.24	3.24	3.24	3.24	3.24	3.51	3.51	3.51	3.78	3.78	3.78	4.05	4.05	4.32	4.59	5.13	5.67
	" sq. ft.	**18.72**	**14.67**	**10.43**	**8.60**	**6.98**	**6.69**	**5.81**	**5.37**	**5.31**	**4.84**	**4.37**	**4.17**	**3.67**	**3.64**	**3.58**	**3.68**	**3.72**
72½%	" lb.	3.30	3.30	3.30	3.30	3.57	3.57	3.57	3.57	3.85	3.85	3.85	4.12	4.12	4.40	4.67	5.22	5.77
	" sq. ft.	**19.07**	**14.95**	**10.62**	**8.76**	**7.69**	**6.80**	**5.91**	**5.46**	**5.41**	**4.93**	**4.45**	**4.24**	**3.73**	**3.71**	**3.65**	**3.75**	**3.79**
72½ & 5%	" lb.	3.13	3.13	3.13	3.13	3.39	3.39	3.39	3.39	3.65	3.65	3.65	3.91	3.91	4.18	4.44	4.96	5.48
	" sq. ft.	**18.09**	**14.18**	**10.07**	**8.31**	**7.30**	**6.46**	**5.61**	**5.18**	**5.13**	**4.67**	**4.23**	**4.02**	**3.54**	**3.52**	**3.47**	**3.56**	**3.59**
72½ & 10%	" lb.	2.97	2.97	2.97	2.97	3.21	3.21	3.21	3.21	3.46	3.46	3.46	3.71	3.71	3.96	4.20	4.70	5.19
	" sq. ft.	**17.16**	**13.45**	**9.56**	**7.89**	**6.92**	**6.12**	**5.31**	**4.91**	**4.86**	**4.43**	**4.**	**3.82**	**3.36**	**3.34**	**3.28**	**3.37**	**3.40**
75%	" lb.	3.	3.	3.	3.	3.25	3.25	3.25	3.25	3.50	3.50	3.50	3.75	3.75	4.	4.25	4.75	5.25
	" sq. ft.	**17.34**	**13.59**	**9.65**	**7.97**	**7.**	**6.19**	**5.38**	**4.97**	**4.92**	**4.48**	**4.04**	**3.86**	**3.39**	**3.37**	**3.32**	**3.41**	**3.44**
75 & 5%	" lb.	2.85	2.85	2.85	2.85	3.08	3.08	3.08	3.08	3.32	3.32	3.32	3.56	3.56	3.80	4.03	4.51	4.98
	" sq. ft.	**16.47**	**12.91**	**9.17**	**7.57**	**6.64**	**5.87**	**5.10**	**4.71**	**4.66**	**4.25**	**3.83**	**3.66**	**3.22**	**3.21**	**3.15**	**3.24**	**3.26**
75 & 10%	" lb.	2.70	2.70	2.70	2.70	2.92	2.92	2.92	2.92	3.15	3.15	3.15	3.37	3.37	3.60	3.82	4.27	4.72
	" sq. ft.	**15.60**	**12.27**	**8.69**	**7.17**	**6.29**	**5.56**	**4.83**	**4.46**	**4.43**	**4.03**	**3.64**	**3.47**	**3.05**	**3.03**	**2.98**	**3.07**	**3.09**
77½%	" lb.	2.70	2.70	2.70	2.70	2.92	2.92	2.92	2.92	3.15	3.15	3.15	3.37	3.37	3.60	3.82	4.27	4.72
	" sq. ft.	**15.60**	**12.23**	**8.69**	**7.17**	**6.28**	**5.56**	**4.83**	**4.46**	**4.43**	**4.03**	**3.64**	**3.47**	**3.05**	**3.03**	**2.98**	**3.07**	**3.09**
77½ & 5%	" lb.	2.56	2.56	2.56	2.56	2.77	2.77	2.77	2.77	2 99	2.99	2.99	3.20	3.20	3.42	3.63	4.06	4.48
	" sq. ft.	**14.79**	**11.59**	**8.24**	**6.80**	**5.97**	**5.28**	**4.58**	**4.24**	**4.20**	**3.82**	**3.45**	**3.29**	**2.90**	**2.88**	**2.83**	**2.91**	**2.94**
77½ & 10%	" lb.	2.43	2.43	2.43	2.43	2.63	2.63	2.63	2.63	2.83	2.83	2.83	3.03	3.03	3.24	3.44	3.84	4.25
	" sq. ft.	**14.04**	**11.**	**7.82**	**6.45**	**5.67**	**5.01**	**4.35**	**4.02**	**3.98**	**3.62**	**3.27**	**3.12**	**2.74**	**2.73**	**2.68**	**2.76**	**2.79**
80%	" lb.	2.40	2.40	2.40	2.40	2.60	2.60	2.60	2.60	2.80	2.80	2.80	3.	3.	3.20	3.40	3.80	4.20
	" sq. ft.	**13.87**	**10.87**	**7.72**	**6.37**	**5.60**	**4.95**	**4.30**	**3.98**	**3.93**	**3.58**	**3.23**	**3.09**	**2.70**	**2.70**	**2.65**	**2.73**	**2.75**
80 & 5%	" lb.	2.28	2.28	2.28	2.28	2.47	2.47	2.47	2.47	2.66	2.66	2.66	2.85	2.85	3.04	3.23	3.61	3.99
	" sq. ft.	**13.18**	**10.36**	**7.34**	**6.05**	**5.32**	**4.70**	**4.09**	**3.78**	**3.74**	**3.40**	**3.07**	**2.93**	**2.58**	**2.56**	**2.52**	**2.59**	**2.62**
80 & 10%	" lb.	2.16	2.16	2.16	2.16	2.34	2.34	2.34	2.34	2.52	2.52	2.52	2.70	2.70	2.88	3.06	3.42	3.78
	" sq. ft.	**12.48**	**9.78**	**6.95**	**5.73**	**5.04**	**4.46**	**3.87**	**3.58**	**3.54**	**3.22**	**2.91**	**2.78**	**2.44**	**2.43**	**2.39**	**2.45**	**2.48**
82½%	" lb.	2.10	2.10	2.10	2.19	2.27	2.27	2.27	2.27	2.45	2.45	2.45	2.62	2.62	2.80	2.97	3.32	3.67
	" sq. ft.	**12.13**	**9.51**	**6.76**	**5.57**	**4.89**	**4.32**	**3.76**	**3.47**	**3.44**	**3.13**	**2.83**	**2.70**	**2.37**	**2.36**	**2.32**	**2.38**	**2.41**
82½ & 5%	" lb.	1.99	1.99	1.99	1.99	2.16	2.16	2.16	2.16	2.32	2.32	2.32	2.49	2.49	2.66	2.82	3.15	3.49
	" sq. ft.	**11.50**	**9.01**	**6.40**	**5.28**	**4.65**	**4.11**	**3.57**	**3.30**	**3.26**	**2.97**	**2.68**	**2.56**	**2.25**	**2.24**	**2.20**	**2.26**	**2.29**
82½ & 10%	" lb.	1.89	1.89	1.89	1.89	2.04	2.04	2.04	2.04	2.20	2.20	2.20	2.36	2.36	2.52	2.67	2.99	3.30
	" sq. ft.	**10.92**	**8.56**	**6.08**	**5.02**	**4.4**	**3.89**	**3.38**	**3.12**	**3.09**	**2.81**	**2.54**	**2.43**	**2.14**	**2.12**	**2.08**	**2.15**	**2.16**
85%	" lb.	1.80	1.80	1.80	1.80	1.95	1.95	1.95	1.95	2.10	2.10	2.10	2.25	2.25	2.40	2.55	2.85	3.15
	" sq. ft.	**10.40**	**8.15**	**5.79**	**4.78**	**4.20**	**3.71**	**3.23**	**2.98**	**2.95**	**2.69**	**2.42**	**2.31**	**2.04**	**2.02**	**1.99**	**2.05**	**2.06**

STEAM AND HOT WATER.

Heating Coils in Furnaces.

The following interesting letter comes from a correspondent in response to a request for the rule he used for determining the size of a coil to be placed in a hot air furnace for heating, by means of radiatiors, rooms that were difficult to heat with hot air:

I have had no experience in the making or installation of hot air furnaces, therefore cannot contribute anything of interest on that subject. I know that the difficulty of heating diatant rooms prevails to a considerable extent, as I hear many complainta and am frequently called upon to remove the cause, and in many instances have resorted to the coil in the furnace and radiators. I have alwaya been successful in overcoming the trouble, but as to giving any reliable rule by which to calculate the amount of heating surface or coil necessary in the furnace, I am afraid I will have to give it up. The conditions vary so much in each case where I have been called that I do not think it possible to give or apply any rule to them. This is one of the many things that one man cannot tell another. The best I can do is to describe just what I did in a peculiar case, and perhaps a rule may be evolved from that which may be of some use.

About 15 years ago I was called to a large residence where there waa a conservatory in the southeast corner of the house; one side, end and roof were of glass, with the side and slant roof facing toward the east. When the wind blew from the east they could not keep that part of the house warm; in fact, the plants would freeze even in moderately cold weather. The furnacemen did all they could, but did not help matters any. The furnace was a large one and was located about 20 feet away from the conservatory. I made a coil of 2 inch pipe and put it inside the fire pot, as shown in the illustration. It was put in in such a manner as not to interfere with the firing process, and to have 9 feet of 2 inch pipe inside the fire pot and directly over the fire and on a level with the top of the fire door. The next thing was to locate the required amount of heating surface in the room to be heated, which was 14 feet long, 7 feet wide and 6 feet 6 inches high. The shape of roof is shown in the cut. When I came to discuss this with the lady of the house, I met the first difficulty. Would she like a pipe coil around the outside walls, put up with return bends and neatly bronzed?

"Oh, no. It would spoil her shelves and burn her plants, and it would look too much like a factory; would not have that at all."

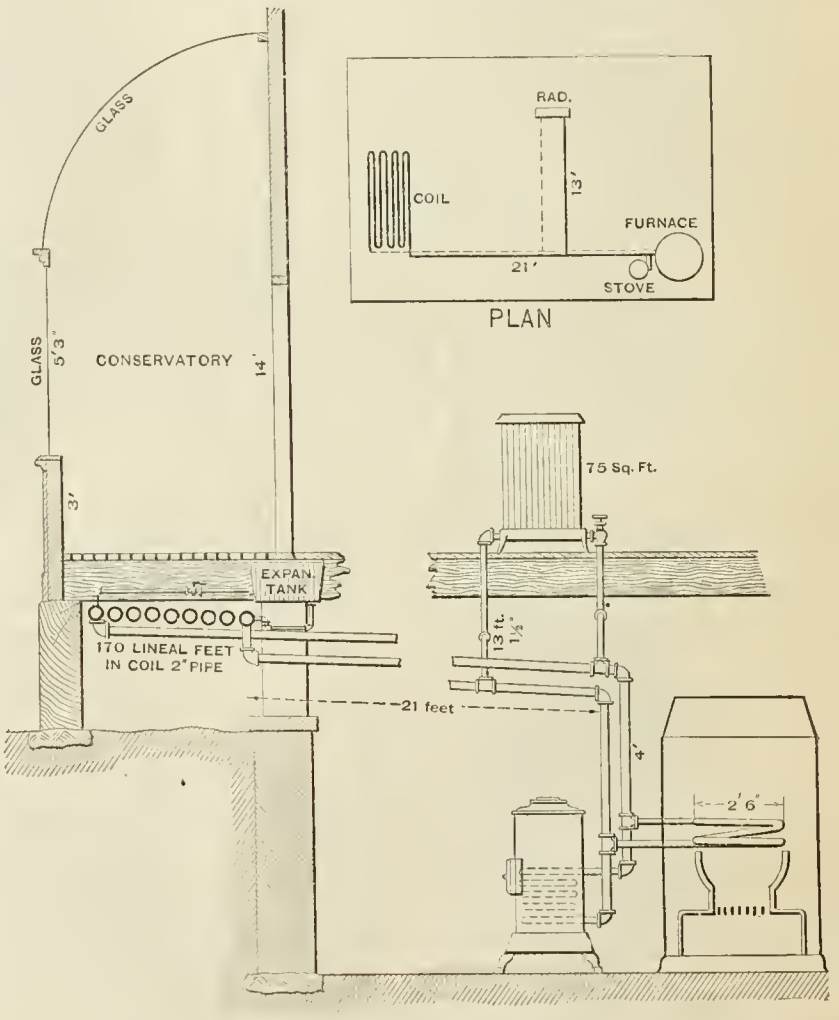
"Then, would a box coil answer, with an ornamental screen and marble top, if necessary?"

"No; could not spare the room."

"Well, then, I am afraid I will have to give it up."

"But you said you could warm this room—what do you mean making all this trouble? If you cannot do it no further argument is necessary."

I went into the cellar and found a window opening into a space about 2½ feet deep under the conservatory floor. I made a flat or gridiron coil, containing 171 lineal feet 2-inch pipe and suspended it from the bottom of the floor joists, giving it an incline sideways, so as to have each pipe a little higher than the one next to it, but kept them level lengthwise. I connected it to the coil in the furnace, putting a drain off cock at the lowest point: I then had the greater part of the floor in the middle of the room taken up, without disturbing the shelves, and relaid it with narrow strips, with ¼ inch of open space between them. The space between two of the joists I lined with copper for an expansion tank, as I could not put it above the floor, then made a connection from the tank to the return pipe, as shown, putting a trap in it purposely to prevent the tank from getting too hot. When I had that fixed it occurred to me, as such things will pop up when one is on the lookout for them, that some evaporation would be desirable in a room where plants were growing and in house heated by hot air, but this must be made without steam. I therefore made a connection with ½-inch pipe from the highest point of the coil to the tank, 3 inches from the bottom, with a stop cock. This answered two purposes; it relieved the coil of air and caused a circulation between the tank and the coil, which was completely under control, by means of which the water in the tank could be kept just hot enough to evaporate freely, but not make any steam. When the fire was started the arrangement worked very nicely, but I found that the window in the wall between the cellar and the space under the conservatory played a very important part in the apparatus. When kept shut and the fire lively the water in the tank showed an inclination to leave it, and I knew that if it should start it would come out like a Yellowstone Park geyser on a small scale, and if the lady of the house happened to be around she would dismiss us and the heater pretty quick. I left the window open and that pacified the tank. I had a loose cover put on the tank, so that if the geyser did play it would do no harm, and took the window in the cellar out altogether and left the thing to take care of itself.



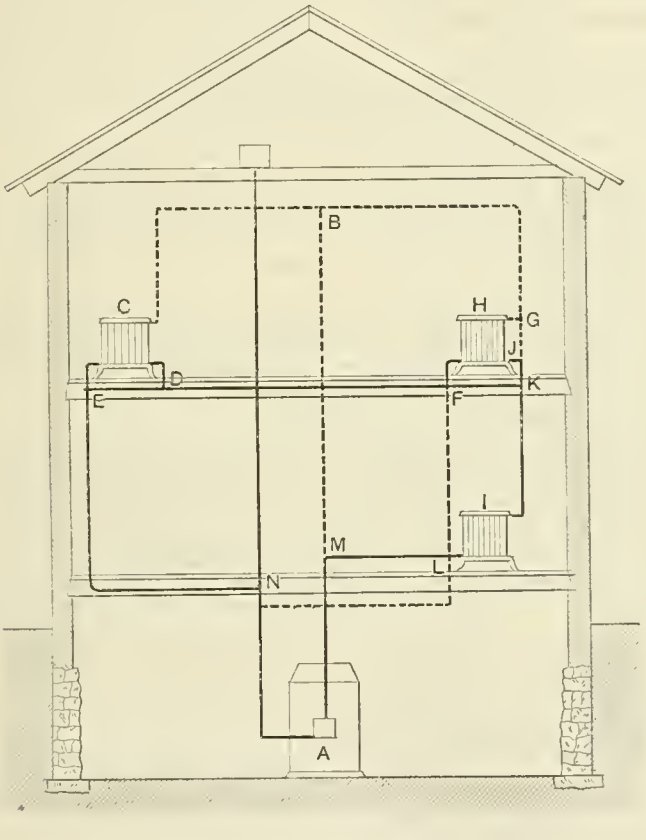
Heating Coils in Furnaces.

Thia condition of things allowed the cellar air to enter the house through the large door between the conservatory and the sitting room, which was always open, and this was not right; but there was no help, as the furnace got most of its air supply from the cellar, which was clean and dry (that is another peculiarity about cranky women—they will keep things clean). The lady of the house was getting very uneasy about the time it was taking, also the disturbance, and didn't have much confidence in the thing anyway, so I concluded I had better leave, as I did not have much confidence myself. I was afraid of that geyser, but I heard nothing about it until the end of the year, when I met the lady's husband on the street, and he told me as he passed that the heater worked like a charm. I was not quite sure he meant what he said, so I concluded I would settle the point by presenting my bill for the job, and if there was anything wrong I would certainly find it out then. As soon as I entered his office he began to tell what a nice heating arrangement I had put in for him, how long he had tried, and how much money he had spent in trying to warm that side of the house. "It gave him pleasure to pay the bill." Conjure in your mind, if you can, the feeling of a plumber at being spoken to in that way when he presents his bill. It was almost too much for me, and I was not sure but it was sarcasm, until a glance at the check he was making convinced me that it was all right, especially when I remembered that previously he used to do some vigorous kicking. I heard nothing more until three years after. When the natural gas was introduced they put the gas in the furnace without my knowing it. Then for the first time the geyser began to play, proving beyond a doubt that what was just right for coal was all wrong for gas. Of course I had to go and fix it, as they could not possibly get along without it. Some time previous to this they had converted a small room adjoining the sitting room into a toilet room, which they wanted to have heated, and I put a 75-foot radiator in the toilet room (the lady of the house was now willing that I should do as I pleased) and connected it up, as shown, without making any change in the former arrangement; this equalized things again, and they went all right. The next winter they wanted to go away for several months, and did not want to leave the furnace at work, but did not want to have the flowers frozen. I made a small heater by making a spiral coil 25 lineal feet out of 1-inch pipe and put it inside of a sheet iron cylinder, and set it on the base of an old stove, and fitted a gas burner inside of it, and limited the supply of gas to just enough to raise the temperature of the water to 190°.

It has done good service ever since, without any trouble whatever. When you come to see so large a proportion of radiation and so small a portion of heating surface, it may conflict with the rules for calculating the amount of heating surface; but we must bear in mind that every inch of the coil is exposed to the hottest part of the fire, with the flame acting directly on it, and is much more powerful than the average heating surface to be found in boilers and other forms of heaters taken as a whole. It is an old saying that a man's faults travel much faster than his virtues; but give the virtues a good start and they will leave faults in the rear.

After the above job was completed it was spoken of around town, and in a short time I had more of that kind of work than I could attend to. A large portion of it I could not do, even if I had had time, as my customers appeared to think there should be no limit to the thing, one man wanting a chicken house that stood about 50 feet from and 15 feet below the kitchen heated from the water back in the kitchen stove, and thought it strange that I did not want to do it. If this experience will be of any use in forming a rule your readers are welcome to it.

I think you will not find any rule that will take the place of experience. If we could make some rule by which we could get over the unreasonable demands and objections of whimsical women, and men as well, it would be a great benefit to the trade; but I fear this problem will be far more difficult to solve than the first one.



Heating Radiators from Furnace.

Heating Radiators from Furnace.

From C. L., *Baltimore.*—Will the system shown by the sketch give a good circulation of hot water from a furnace containing a boiler 12 x 24 inches with 1 inch supply? I shall be glad to receive any suggestions.

Note.—Our correspondent asks for assistance, and any suggestions from our readers will be welcome. In our opinion the system shown by the solid lines would not prove satisfactory. A better plan would be to run a 1½ inch pipe from the boiler A directly to B, as shown by the dotted lines, taking a 1 inch branch over to the radiator C and returning from the radiator to the boiler, taking out the pipes D, and the horizontal pipe from E to K. From B take a 1¼ inch branch to G, taking a 1 inch connection to the radiator H, and reducing the pipe to 1 inch and continuing to the radiator I. From the radiator H bring a 1 inch return to L, where a 1-inch connection should be made to radiator I, and the return increased to 1¼ inches and taken over to N, where the return should increase to 1½ inches and return to the furnace boiler A. A 1-inch pipe should run from N up to the expansion tank. An air valve should be placed at B, which should be made the highest point of the system. The pipe from M to L should be taken out.

Location of Expansion Tank.

From Rex, *Rochester, N. Y.*—In reply to the inquiry of "M. K." in *The Metal Worker*, March 31, the expansion tank should in all cases be placed on the highest line that the radiators are placed on, and connected both to the return and flow pipes, so that there will be a circulation through the expansion tank at all times. By doing this it will avoid any snapping and cracking in the heating pipes and also prevent the emptying of the boiler, if connected to same, through careless firing. By connecting the expansion tank as above stated, the tank can be placed in a colder place, such as attics, and a large vent pipe be run to some suitable point. So connected it is not very apt to freeze up and burst the boiler, as the writer has seen in a number of cases with the single connection.

T. C. Joy & Co., Titusville, Pa., manufacturers of the Joy steam and hot water heaters and radiators, recently made a slight reduction in wages, which was accepted by all their employees, with the exception of the moulders. The firm

do not anticipate any serious trouble and expect to be running with a full complement of men within a week or ten days.

HEATING NOTES.

Secretary Geo. H. Reynolds informs us that the headquarters of the Master Steam and Hot Water Fitters' Association of the United States will be transferred to the Broadway Central Hotel, New York City, May 1, and that all communications should be sent to that address after that date. This is the hotel that has been selected for holding the national convention June 19 to 21, and Secretary Reynolds will be found there up to that time.

Wm. M. Barber, heating engineer of the Smith & Anthony Company, Boston, Mass., made a visit to the New York house at 54 Beekman street, recently. Mr. Barber drew the plans for the Model School that were sent to the World's Fair by Chief Wade of the Massachusetts State Board of Inspectors.

Geo. P. Jacobs & Company, Brooklyn, N. Y., who make a specialty of supplies for steam and gas fitters and plumbers, are sending out a very convenient desk blotting pad. Cutting and threading pipe to specifications up to 10 inches in diameter occupies one department of their business and heating by either exhaust or live steam another.

The Penn Engineering Company, 312 Cherry street, Philadelphia, are putting on the market a ball joint pipe hanger which they claim will swing in any direction that the pipe expands and is easily adjusted.

The A. A. Griffing Iron Company, Frank Somers agent, will remove their Chicago office from 88 Lake street to 34 Dearborn street.

The Ringen Stove Company, St. Louis, have just completed what is considered one of the largest hot water heating contracts in the West, at the St. Joseph Orphan Asylum, St. Louis, Mo. There are about 18,000 feet of radiation in the building connected with a battery of two 5 x 18 foot boilers which contain each 72 lap welded boiler tubes 4 inches in diameter and 18 feet long. It was deemed advisable to place the boiler at a distance from the building for safety sake, and therefore a large tunnel had to be built purposely for the accommodation of the flow and return pipes for this heating construction. The boiler houses are 120 feet west of the asylum. In the tunnel are laid two 15-inch hot water flow and return mains, through which all water passes.

A. A. Griffing Iron Company, 15 Dey street, New York, have been made the Eastern agents for the Powers regulators, made by the Powers Duplex Regulator Company of Chicago. They have just closed a contract for their introduction in the schools of Long Island City, where they will be used for regulating the dampers in the air ducts as well as for controlling the fire. One of their new things displayed in their window is the Princess radiator, which is of the flue type, handsomely decorated.

The Barron Steam Heating Company have a fine office in the Cable Building, at Broadway and Houston street, New York, where they have just moved.

Pursuant on the death of Arad T. Foster, president of the Haydenville Mfg. Company, 73 Beckman street, New York, a meeting of the directors was held on April 5 to elect new officers. H. H. Beals, treasurer and secretary of the company, was elected president and general manager, retaining also his office as treasurer. Cuyler K. Sanborn, lately vice-president, was elected vice president and secretary. No changes will be made in the policy of the firm, which will continue to be carried out on the lines laid down by their late president.

T. C. Joy & Co., manufacturers of the Joy steam and hot water heaters and radiators, have moved their Chicago office to 82 Lake street.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

The plumbing contract, amounting to $4496, for the new post office at Lowell, Mass., is reported to have been let to the Dalton Company of Chicago.

A. V. Fetter, La Crosse, Wis., has been awarded the contracts for plumbing the new opera house at Stevens Point and also large buildings at Medford and Marshfield.

The James Steam Heating Company, 109 South Sixth street, Brooklyn, are engaged in remodeling the steam heating plant in the carriage factory of R. M. Stivers & Co., New York.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until May 1 for the interior finish and plumbing of the United States Court House and Post Office building at Sioux Falls, S. Dak. Drawings and specifications may be had from the Supervising Architect, Washington, or from the superintendent at Sioux Falls.

The Smith & Anthony Company, Boston, Mass., are installing the heating plant in the High School building at Arlington, Mass. It is on the blower system with fan, two water tube boilers and the equivalent of 6000 feet of radiation.

Bids will be received by the Board of Education of Cincinnati, Ohio, up to April 16, for the heating and ventilating and a system of flush closets for an eight-room school building.

E. C. Worrell, Moorestown, N. J., will install a steam heating plant and do the plumbing work in the new residence of Samuel L. Allen, at Stanwick.

The contract for plumbing the Wachusett House, at Princeton, Mass., has been awarded to Wm. F. Tucker of Worcester.

The Theo. Jacobs Company, 72-74 Market street, Chicago, have contracted to furnish new boilers and heaters for the building occupied by the Columbus clothing store, State and Monroe streets.

E. Baggot, 169-171 Adams street, Chicago, has taken the contract for the plumbing and sewerage in the Garfield Building, Euclid avenue and Bond street, Cleveland, Ohio.

The J. L. Mott Iron Works, 311-313 Wabash avenue, Chicago, have received orders for two Sunray hot water heaters from Los Angeles, Cal.

Cook & Chick, 253-255 Kinzie street, Chicago, are to install steam heating plants in the flat building of Mrs. M. A. Roth, Jackson Boulevard, near Troy street, and in the flat building of George Bloom, Lawndale avenue.

Ring & Reardon, 3841 Finney avenue, St. Louis, have installed a number of Sunray hot water heaters and received orders for six more.

J. F. Connell, 687 West Indiana street, Chicago, has contracts for the plumbing and gas fitting in the residence of A. B. Campbell, 378 Hoyne avenue; flat building of J. B. Nash, 648 West Erie street, and residence of B. Byan, 840 West Chicago avenue.

The contract for heating and ventilating the new and old prison buildings and warden's residence at Norristown, Pa., has been awarded to the Penn Engineering Company, 312 Cherry street, Philadelphia. The bids were opened in the presence of the bidders and ranged from $4283 to $6031. The amount of the Penn Company's bid was $5210. Edwin F. Bertolette of Norristown, is the architect, and the bids were made upon specifications prepared by him.

J. Sidney Villere & Co. have designed for Miss Etta R Gregory a three-story apartment building to be erected at 16 and 18 St. James place, Chicago, at a cost of $18,000, which will be heated from a hot water plant.

Babb, Witham & Kelley, the plumbers and steam heaters, are installing a steam heating plant in St. Mary's Parochial School, at Bangor, Maine.

Dilworth Carter is building a $6000 residence at Astoria, Ill., which is to be heated by steam or hot water, for which estimates are desired.

D. H. Kelly has secured the contract for the plumbing and steam fitting for the new factory of the Williams Typewriter Company, at Derby, Conn.

Bids will be received until April 16 for the plumbing, gas fitting, heating and ventilating of a High School building to be erected at Lincoln, Neb.

The S. Wilks Mfg. Company, 113 Clinton street, Chicago, have shipped four of their heaters to the Rider Heating Company, Helena, Mont.

Foster & Glidden, general agents for the Farquhar Heating Company, 58 Dearborn street, Chicago, report the following contracts: Hot water heating in the residence of D. N. Hanson, Forty-eighth street and Ellis avenue, and residence of A. B. Smillie, Norwood Park, Ill., steam heating in Park Home Hotel, Blue Island, Ill., and combination heating in residence of F. P. Bagley, Hinsdale, Ill.

A petition signed by 830 captains of British ships navigating the North Atlantic, commanding a gross tonnage of nearly 2,000,000, and representing crews of about 30,000 men and capital of $150,000,000, has been forwarded to the British Government, praying them to make prompt co-operation with the United States Government in destroying ocean derelicts, which constitute a great danger to life and property on the Atlantic.

The Russo-German commercial treaty, recently arranged after much opposition, went into operation on the 20th inst. It is to remain in force for 10 years.

PLUMBING and GAS FITTING.

Pratt Institute Graduates in Plumbing.

On the evening of March 23 a committee of the Journeymen Plumbers' Association of Brooklyn visited the trade school of the Pratt Institute, and held an examination of the plumbing class, with the view of awarding certificates to those students who had completed the prescribed course of study. The examination included an inspection of the work of the candidates and questions by the Examining Committee, which covered a thorough knowledge of methods and work, together with the sanitary and scientific conditions underlying the subject.

Certificates were awarded to six students—namely:

J. S. Wright,
L. Calahan,
J. J. Heilman,
J. Munk,
A. L. Maxwell,
C. B. Kineo,

all of Brooklyn. The committee were accompanied by three master plumbers, who expressed themselves warmly in regard to the progress and efficiency of the class.

These certificates were for the first time, under the new arrangement, granted by the Board of Directors of the Journeymen Plumbers and Steam and Gas Fitters' Helpers of L. U. No. 1. They were countersigned by the trustees of the institute. The institute no longer grants certificates to the evening classes.

Trouble Among Chicago Plumbers.

The Chicago plumbers have decided to strike unless their employers agree to pay the same wages during 1894 that were paid last year. The journeymen plumbers have submitted to the employers individually an agreement, of which the following is a copy:

Agreement entered into between the undersigned employing plumbers and the Chicago Journeymen Plumbers' Protective and Benevolent Association:

SECTION 1. That the hours of labor shall be from 8 a.m. until 5 p.m., with one hour for dinner, and on Saturday from 8 a.m. to 4 p.m., with one hour for dinner, excepting the Saturdays from June 15 to September 15, when the hours of labor shall be from 8 a.m to 12 m.

SEC. 2. That wages shall be $3.75 per day, excepting the Saturdays between June 15 and September 15, for which they shall be $2.25.

SEC. 3. That wages are due and payable when work ceases on Saturdays.

SEC. 4. All Sunday, New Year's, Christmas, Fourth of July, Thanksgiving and overtime work shall be paid for at the rate of double time.

SEC. 5. That members working outside the city of Chicago shall be subject to all the conditions of this agreement, and in addition thereto shall have their board and railroad tickets furnished; traveling time paid at the rate of regular time; when traveling at night sleeper to be furnished where the distance is more than 100 miles; no charge for time traveling at night; Sunday traveling to be paid at single time.

SEC. 6. That sections 1, 3, 4 and 11 of this agreement shall also govern the junior plumbers.

SEC. 7. That all men shall be held responsible for incompetent work when it is due to their negligence and other causes directly traceable to their carelessness and incompetency.

SEC. 8. That whenever a question shall arise between the employing plumber and the employee in regard to inferior work done by said employee, and said question cannot be settled by said parties, then an Arbitration Committee shall be appointed consisting of two plumbers, one to be selected by the employing plumber and the other by the Journeymen Plumbers' Protective and Benevolent Association, and in case said committee of two cannot agree, then said committee shall select a third party, and the decision of the majority of said committee of three shall be final and binding upon both parties.

SEC. 9. That no more than one helper shall be allowed for every three journeymen plumbers working in a shop.

SEC. 10. When more than one man is required on a job it must be under the supervision of a journeymen plumber.

SEC. 11. A sympathetic strike, when ordered by the Building Trades' Council, will not be a violation of this agreement.

SEC. 12. That this agreement shall continue for the space of two years, beginning on the first day of April, 1894, and ending on the first day of April, 1896.

SEC. 13. That in case the parties to these presents shall desire to enter into a further agreement at the expiration of this agreement, then said agreement shall be made by and between said parties at least three months previous to the expiration of the present agreement.

In witness whereof the parties to these presents have hereunto set their hands and seals.

....Name.

.. .. Address.

CHICAGO JOURNEYMEN PLUMBERS' PROTECTIVE AND BENEVOLENT ASSOCIATION.

By .....

The agreement submitted by the Master Plumbers' Association to the union contains the following clauses to which strong objections are made by the men:

That wages shall be $3 per day excepting the Saturdays between July 15 and September 15, for which they shall be $1.50.

That the members of the Chicago Journeymen Plumbers' Association will be responsible for their work, for their incompetency, and that said association shall be responsible for said incompetency.

That this agreement shall continue until December 31, 1895.

That journeymen plumbers furnish their own furnaces.

A large and enthusiastic meeting was held by the Chicago master plumbers, at their hall, 197 Madison street, on Monday afternoon, April 2. The unanimous opinion of those present was that some of the demands made by the Journeymen's Protective and Benevolent Association were unjust.

A large number of the master plumbers who were interviewed criticised the proposed journeymen's agreement as follows:

Sec. 2. The reason the full amount of wages was not conceded was that many investors, having plans prepared, and comparing them with like plans executed during the World's Fair season, discovered that there was not sufficient difference in the estimates offered as compared with the general decline in the price of material, and have not, therefore, entered into the construction of the buildings intended.

Sec. 4. Regarding this section, only time and a half should be paid for overtime between 5 p.m. and 12 m.

Sec. 5. Objected to.

Sec. 8. We do not know what value the agreement would be to us if section 8 was adopted.

Sec. 9. The helper question should be regulated by the Master Plumbers' Association.

Sec. 10. Superintendents of work should always be at the discretion of the employer.

The journeymen plumbers claim that they have already secured a number of signatures of employers to their proposed agreement, but the Master Plumbers' Association assert that those who have signed are only master plumbers running small shops and employing very few men.

TRAPS AND VENTS.

THE BOARD OF HEALTH of Norfolk, Va., have recommended an ordinance to the City Council for adoption that was prepared by a joint committee of master and journeymen plumbers.

THE FOLDING BATHTUB COMPANY, Marshall, Mich., send out colored circulars calling attention to the folding bathtubs of their manufacture. In addition to these specialties the firm also make stationary bathtubs, bath heaters, sanitary bath chairs, clothes hampers, combination commodes, &c.

SAMUEL DAVIDSON of the Steel Clad Bath Mfg. Company, New York, is on a trip through the South explaining that the Steel Clad bath has all the advantages of the wood copper lined bath and all of the advantages also of an exposed plumbing fixture.

The Metal Worker is indebted to Plumbing Inspector Wm. Lunn of Memphis, Tenn., for a copy of the plumbing ordinance recently passed by that city. In a letter inclosing the ordinance he says: "Our sewer system is of the G. E. Waring design, and in many places very near the surface. A large amount of our laterals from the 20-inch main are 6-inch pipe with 4 inch house connections, and each lateral has a great many house connections. The system gives general satisfaction." With a loyal pride he adds, "I will also state that our plumbing will compare favorably with that of any other city".

MARK R. DAYKIN of the plumbing firm of Daykin Bros., Cleveland, Ohio, is a candidate for the School Council of his city at the spring election.

THE BOARD OF HEALTH of Sacramento, Cal., have elected G. W. Horr sanitary and building inspector and Victor J. Talley plumbing inspector.

THROUGH AN ERROR a plumbing ordinance of New Haven, Conn., omits the word "iron" after the words "extra heavy," relating to drain pipes. As a result a spirited contest has waged between a sewer contractor and the

mayor, which will end in the ordinance being amended.

Murray & Maher, New London, Conn., have moved their plumbing and tin shop to 15 Main street.

Dedham, Mass., has under consideration a system of plumbing regulations.

Jacksonville, Fla, has passed an ordinance of 15 sections remodeling the plumbing ordinance of 1889. The plumbers will now have to pass an examination and do their work on the approved modern plan.

The Master Plumbers' Association of Newark, N. J., have made application for membership in the National Association of Master Plumbers, so we are informed by Secretary Don.

The New York Trade School will continue the day class in plumbing, beginning April 9, until April 28, for the benefit of such pupils as desire more practice.

The Court of Special Sessions of New York City last Monday inflicted a fine of $10 on a First avenue plumber who was doing work in violation of the law requiring a certificate of competency and a license. Several other cases are before the court for trial.

Manchester, N. H., has a new set of plumbing regulations of 24 sections.

Widdos & Shaneberger have opened a plumbing establishment at 459 Northampton street, Easton, Pa.

Macon, Ga, is to have a system of sewers, amounting to a length of 42 miles. Gabourg & Noble, Anniston, Ala., have the contract at $100,000.

J. W. Chamberlain & Co, plumbers, have been incorporated, at Bangor, Maine. Joseph W. Chamberlain is president of the new concern and Joseph E. Chamberlain treasurer.

The Detroit Master Plumbers' Association held a reception and ball at Clawson's Hall, 96 Miami avenue, Detroit, on the evening of the 4th inst.

Grant Crittenden, Pekin, Ill., has taken a partnership with Henry Hurkett in his plumbing business.

Arthur Shea, Rockland, Maine, has been making extensive improvements in his plumbing shop in the Glover & Ames Building in that city, where he has been located for the past 12 years.

John C. C. Bohlman & Co. is a new plumbing concern that has gone into business at Pittsfield, Mass.

Smith & Webster, 193 Lake street, Chicago, have moved their plumbers' supply factory to 15 to 21 North Clinton street. The show-room will remain at 193 Lake street until May 1, when a more central location will be secured.

George Fish is arranging to open a plumbing establishment in the Schlosser Building on Ferry street, Albany, Ore.

A. G. Hale and L. W. Thurston, both lately with L. E. Smith & Co., have formed a partnership and will conduct a general plumbing business under the firm name of J. P. Hale & Co. at the store 12 Short street, Gloucester, Mass., formerly occupied by Richard Tufts. They will carry a stock of stoves, furnaces and plumbers' materials, and will pay special attention to tin roofing, pump and vessel work in addition to sanitary plumbing, ventilation and house drainage.

FLASHINGS.

A company, under the style of the Baker Red Slate Company of Troy, N. Y., have been incorporated by Troy capitalists to quarry slate at North Granville, N. Y., with a capital of $100,000.

Most of the slate workers in the Bangor and Pen Argyl district, Pa., struck this week against a reduction of wages recently put into effect. The men are now paid from 85 cents to $1.25 a square, but demand a return to the old scale. It is thought that there will be a general cessation of work in the quarries until the question is settled. The slate industry is just reviving after several months' slackness, and the quarries were running at their fullest capacity.

As an evidence of reviving activity in the building industry the large shipments of roofing slate made by the Slatington-Bangor Syndicate in the month of March are significant. They were much above those of January and February and beat all previous March records. The shipments were in 90 carloads, comprising 4341 squares, and were sent all over the United States east of the Rocky Mountains. The syndicate is said to have orders booked for the season for 25,000 squares, and they regard the outlook for the slate trade in the present year as being remarkably good.

Marlin & Co., Incorporated, Allegheny, Pa., manufacturers of eave troughs and water conductors, have recently added considerable machinery to their equipment and are now prepared to furnish a full line of round and corrugated water conductors in 10-foot lengths. Included in the new machinery added by this firm is a 10-foot power squaring shear, also a forming machine for making eave troughs up to 10 feet in length. For some time past this firm have been working on large orders for galvanized iron cans, to be used for freezing artificial ice. Orders for these cans have been received from artificial ice makers in Philadelphia, Pa., Louisville, Ky., Massilon, Ohio, and other points. The business of Marlin & Co., Incorporated, was established in the present location in Allegheny, Pa., a few years ago under the name of Armor, Marlin & Co., and later changed to Marlin & Co., and finally to Marlin & Co., Incorporated, and has grown very rapidly. Their trade for last year was considerably larger than for any year in their history, notwithstanding the general depression in business. At this time the firm are fully occupied in turning out their various products, and are giving employment to a large force of men.

The iron and steel roofers of Ohio have apparently found bottom on prices and are now getting down to business. Orders are reported more plentiful and the general appearances of activity at the various factories are more satisfactory. Nearly all the roofing and corrugating concerns of Ohio have now become extensive users of galvanized sheets and report increased demand for that class of goods.

The American Roofing Company, St. Louis and Cincinnati, report an improved trade, which has enabled them to equal their March business of last year. The outlook for the present month is excellent, and unless something unforeseen occurs they expect to also equal their April record of last year. They report a good demand for gutters, conductor pipes, elbows, &c. They have just issued a new catalogue relating to these goods, which is now being mailed to the trade.

OBITUARY.

WILSON C. BERGER.

Wilson C. Berger, superintendent of the Berger Mfg. Company, Canton, Ohio, died April 2 after an illness of three weeks. Mr. Berger was born in Millersburg, Pa., 43 years ago. While he was a boy, but 19 years of age, he went to Canton and has resided there ever since, always taking an active part in business and charitable enterprises. In 1872 Mr. Berger married Miss Mary Myers, who with a daughter and two sons survive him. Mr. Berger was a solid and experienced business man and very popular among his employees and friends. His name has become prominent in manufacturing industries, and the business with which he was connected has prospered under his skillful and conscientious management.

JOHN WILKESON.

The death is announced, on April 4, of John Wilkeson, one of the oldest and best known citizens of Buffalo, at the age of 88. Mr. Wilkeson, who was born at Poland, Ohio, was in his earlier days a prolific inventor, and held many patents on stoves and heaters. With his father and brothers he was largely engaged in the iron business in Western New York and Ohio. Later he became interested in the timber and elevating business. He saw active service during the war, in which one of his sons was killed.

ARAD T. FOSTER.

We regret to announce the sudden death, at his home in Brooklyn, on March 30, of Arad T. Foster, president of the Haydenville Mfg. Company and vice-president of the Peck Bros. Mfg. Company of this city. We will give a fuller notice of Mr. Foster in a later issue.

Milk Can for Mule Back.

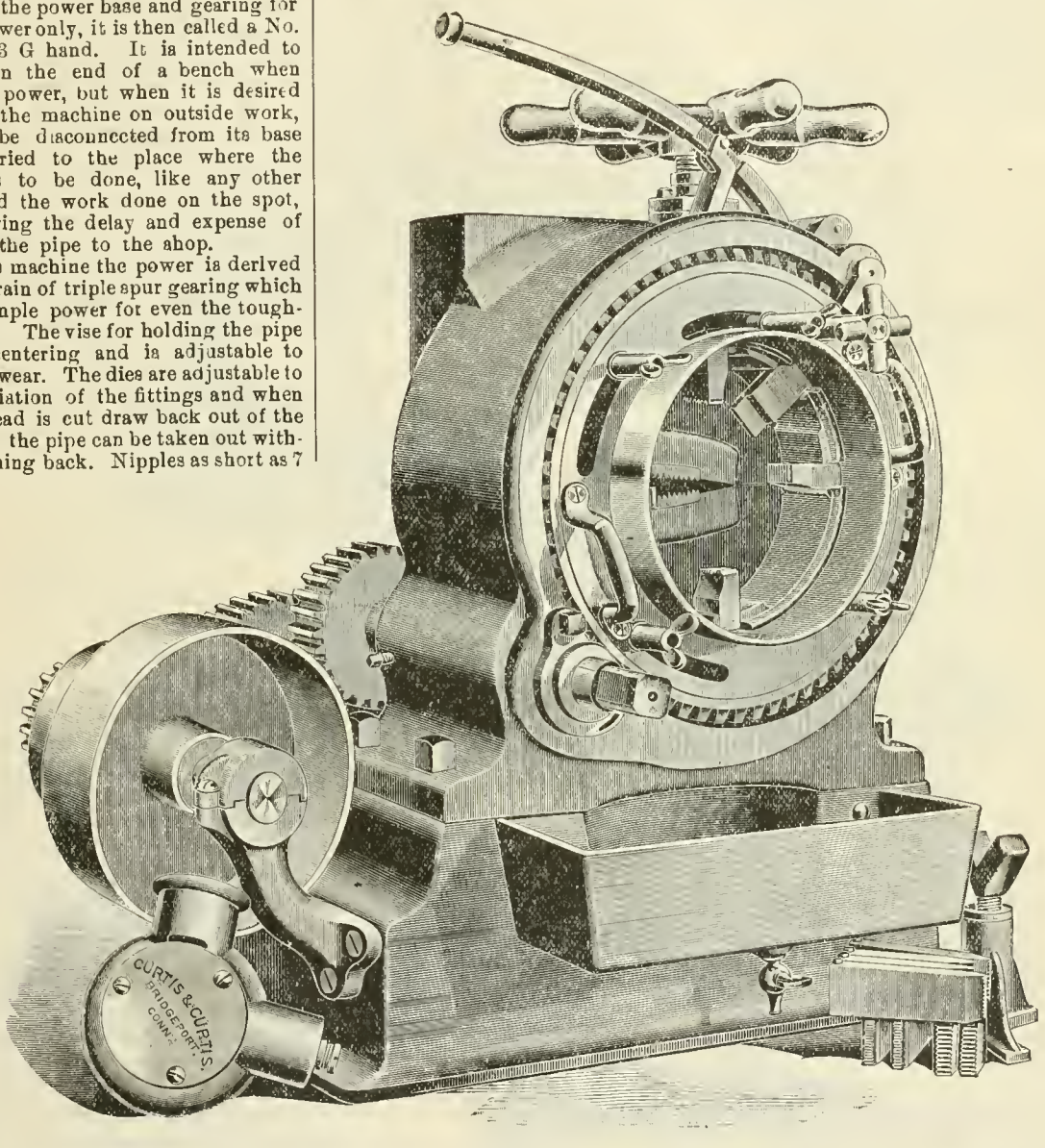
Iron Clad Mfg. Company, 22-24 Cliff street, New York, are manufacturing a novel milk can for fastening on each side of a mule for transportation in mountainous sections. These are sent principally to South American countries, where the milk dealer serves his customers by this method instead of using a horse and wagon, as with us. The can is 21 inches high, 19 inches long and 9 inches through. The top and bottom are round, while the center on both sides is slightly concave, to fit the mule's sides. They are made in three capacities, 5, 8 and 10 gallons. The material is No. 20 gauge sheet steel, tinned. In the center of the top is a 5-inch round opening, so made as to be absolutely tight, the cover being fitted with a lever and rubber gasket, the whole contrivance projecting about 2 inches above the top of the can. The sides extend ¾ inch beyond both ends. On the top are two milk can handles, while the bottom has one.

Indications in the Lake Superior region point to the earliest opening of navigation on record. Everything of this character helps in the revival of business and in the employment of men who have long been idle.

New Form of Forbes Die Stock.

Curtis & Curtis of Bridgeport, Conn., have just brought out a new development of the Forbes patent die stock, which is here illustrated. It is operated by hand or power and is designed to cut off and thread, right hand, all sizes of wrought iron pipe from 1 to 6 inches inclusive. When this same machine is supplied with both right and left hand dies, it is then called a No. 3 G power machine, and when made without the power base and gearing for hand power only, it is then called a No. 3 F or 3 G hand. It is intended to stand on the end of a bench when used by power, but when it is desired to use the machine on outside work, it can be disconnected from its base and carried to the place where the work is to be done, like any other tool, and the work done on the spot, thus saving the delay and expense of carting the pipe to the shop.

In this machine the power is derived from a train of triple spur gearing which gives ample power for even the toughest pipe. The vise for holding the pipe is self centering and is adjustable to take up wear. The dies are adjustable to any variation of the fittings and when the thread is cut draw back out of the way and the pipe can be taken out without running back. Nipples as short as 7 inches can be made without a nipple holder, and with the aid of the Curtis nipple holder, manufactured by this firm, short or close nipples can be made.



New Form of Forbes Die Stock.

Argentina's condition is regarded as very promising. Official reports show that the country during 1893 maintained a steady recovery from the depression of previous years. Immigrants numbered 110,226, while the departures were only 64,100, leaving a balance of 46,126 in favor of the republic.

Yet another ship canal is about to be undertaken on this continent. Last week the Ontario Legislature granted a franchise incorporating the Huron-tario Ship Canal Company and empowered it to have one terminal point on Lake Ontario, near Toronto, and another on Georgian Bay, near Collingwood. This canal will, it is claimed, shorten the route from the West to Liverpool by 800 miles. The capital stock of the company is placed at $65,000,000, and a number of American capitalists are said to be interested in the scheme.

According to the *Labor Gazette* of London, labor disputes in England last year involved 602,668 persons. Of these strikers 390,844 were successful and 134,864 were partially successful, while 68,934 were unsuccessful, and the results were not known in the cases of 8026. The figures for 1893 are of unusual interest, since they embrace the results of the Lancashire cotton strike early in the year and the great coal strike in the summer and fall. The latter dispute is included among the "successful" ones, which accounts for the large figures under that heading.

Among the companies recently incorporated according to the laws of the State of New York is the New York & Chicago Ferris Wheel Company of New York. With a capital of $600,000 the concern will manufacture and exhibit wheels of the Ferris type, constructed for purposes of observation and amusement. The directors are named as follows: Geo. W. G. Ferris of Pittsburgh, Andrew Onderdonk of Chicago, and F. L Marshall, Anson Maltby and Wm. G. Russey of New York City.

M. Bartissol's scheme for the carrying out of the Panama Canal project is said to include a plan for the cutting of a stone tunnel some six miles long through the high level of the canal. Into this the Chagres River is to be turned, and through sluices it is to be discharged into the excavated earth, the force of the stream being counted on to carry the earth off to the Pacific Ocean. Owing to the liability of the river to swell dangerously during freshets, the plan is, however, regarded by some engineers as impracticable.

Experts assert that the passage of the new ship canal across the Isthmus of Corinth is not without possible danger to steam vessels. At certain points, it is said, the danger of a landslip, notwithstanding all precautions, is not excluded. It is believed that the larger portion of the traffic through the canal will be composed of sailing vessels.

J. Stub has opened a tin shop at Brownsfield, Maine.

THE TIN SHOP.

Pattern for Four-Piece Elbow.

From L. A., *New York.*—I would like to have a method published in *The Metal Worker* for describing the pattern of a four piece elbow.

Answer.—In Fig. 1, let *e f g h* represent a cylinder cut by planes oblique to its axis, as shown by *o o'*, *p p'* and *q q'*. An inspection of the figure will show that the angle *e o o'* is similar to the other like angles, as *o o' p'*, *p' p q* and *q q' g*. If these sections A, B, C, D were placed together as shown by A*a* B*a* C*a* D*a* in Fig. 2, a four-piece elbow would be the result. In Fig. 3 the elevation of a four-piece elbow, similar to that in Fig. 2, is shown in connection with the profile and half pattern. To obtain the elevation, draw the square J K L M, and from J as center strike the arc M P K. Also draw J L. Divide the eighth of a circle M P into one less number of parts than there are to be pieces in the elbow, and as in the present instance there are to be four, M P is to be divided into three equal parts, as indicated by the small figures in M P. From the first division, as O, draw O J. Make K Q equal to M O, and draw Q J. From O drop the perpendicular O G, and from the point N set off the diameter of elbow, as shown by N *n*. Through point *n* draw E *o* parallel with G O, and also draw E G parallel with J M. With *x* as center strike the profile E F G H, and divide E F G into any convenient number of equal parts. From the points thus obtained erect perpendiculars, cutting the miter line O J, as shown. Connect the points O P, P Q, and draw Q R parallel with L K. Make J *p* and J *q* equal to J *o*, and draw *o p*, *p q*. Also draw *q r* parallel with Q R. Then R Q P O N *n o p q r* is the elevation of a four-piece elbow.

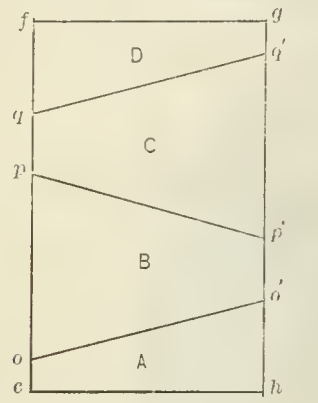


Fig. 1.—Elevation of Cylinder from which Sections are Obtained.

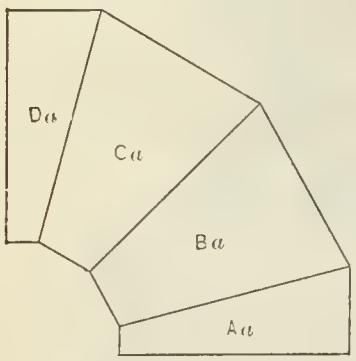


Fig. 2.—Sections Placed Together so as to Form an Elbow.

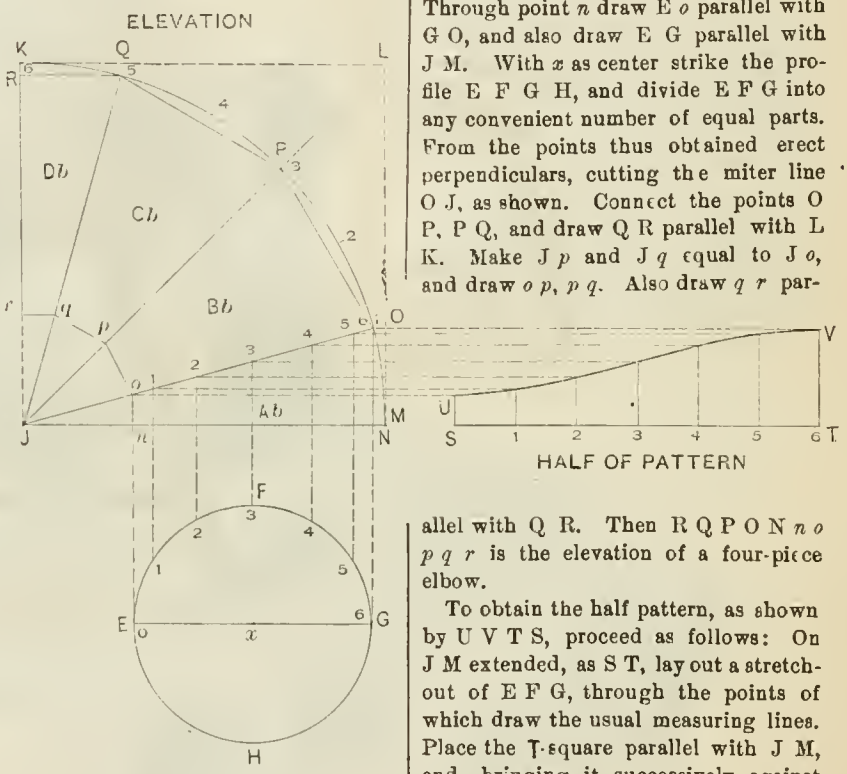


Fig. 3.—Method of Obtaining the Half Pattern.

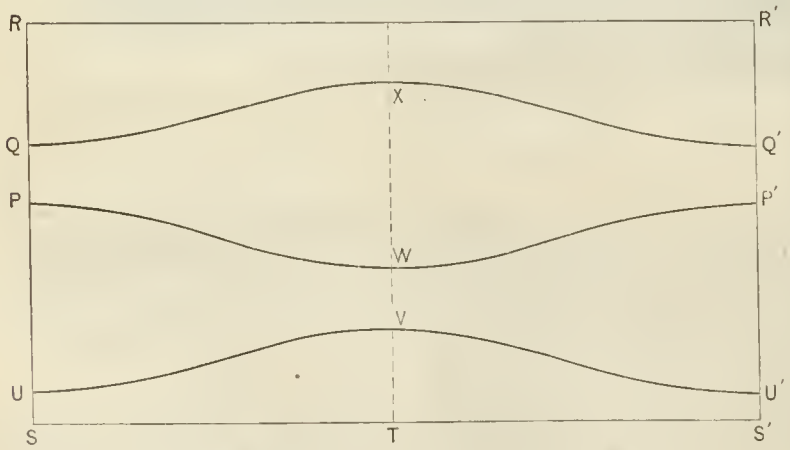


Fig. 4.—Half Pattern Used for Obtaining Pattern of Whole Elbow.

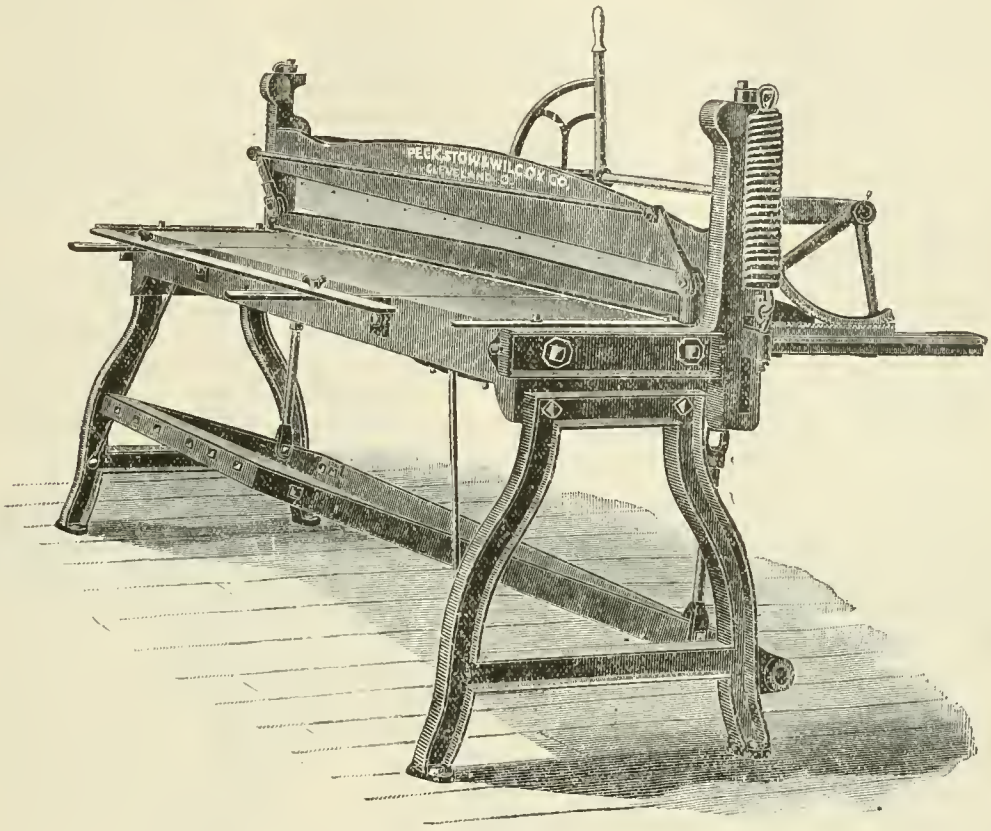
PATTERN FOR FOUR-PIECE ELBOW.

To obtain the half pattern, as shown by U V T S, proceed as follows: On J M extended, as S T, lay out a stretchout of E F G, through the points of which draw the usual measuring lines. Place the T-square parallel with J M, and, bringing it successively against the points in the miter line J O, cut the corresponding measuring lines. A line traced through the points thus obtained, as shown by U V T S, will form the half pattern of part of elbow shown in elevation by O N *n o*, or in profile by E F G. It will be observed that only part of the elevation has been used for obtaining the half pattern, which was derived from the miter line J O in connection with the profile E F G H. In practice it is only necessary to draw the half profile E F G, and above, and in line with same, the right angle J M L, making M J and M L the same length. Connect J L, and with J as center strike the arc M P, which is the eighth of a circle. Divide M P into one less number of parts than there are to be pieces in the elbow, and from the first of these divisions, as O, draw the miter line J O. The pattern is then to be obtained as previously described. The entire pattern of elbow, as shown in Fig. 4 by R R' S S', can be obtained by the use of the half pattern U V T S, as follows: On the line S S' lay the half pattern and mark about it as shown by U V T S. Re-

verse the pattern and mark T V U′ S′. From S and S′ erect the perpendiculars S R and S′ R′. Make U P and U′ P′ of pattern equal to O P of elevation, and also make V W of pattern equal to *o p* of elevation. By using the pattern as previously described, draw P W and W P′. Q X Q′ can be drawn in a similar manner. Make S R and S′ R′ equal and draw R R′. The usual allowances for joining to be made on S R and S′ R′.

Cornice Makers' Squaring Shear.

Peck, Stow & Wilcox Company, Cleveland, Ohio, and 27 Chambers street, New York, are introducing an improved cornice makers' squaring shear, as here shown. This shear is brought out principally for the use of cornice makers and is supplementary to an extensive line of squaring shears made by this concern. It has a hold down attachment and gauges for squaring and cutting at angles, with a lever on graduated arc for working the back gauge with gear and rack from the front of the shear. The arc has a scale up to 27 inches, showing fractions of an inch, and by means of this device the gauge can be set at any point instantly, without leaving the front of the machine. The shear is made in but one size, 97 inches, and is warranted to cut No. 22 iron.

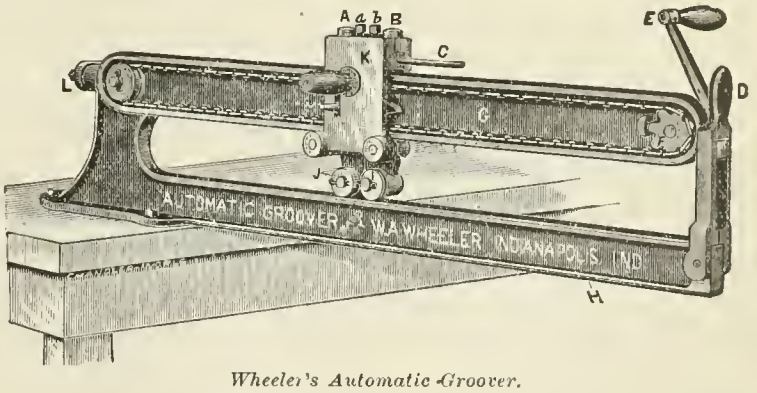


Improved Squaring Shear for Cornice Makers.

Official returns recently published show that the output of coal last year from the English Midland districts was affected by the coal strike to the extent of nearly 17,000,000 tons, compared with the preceding year. The falling off was comparatively as great in the other mining districts of Great Britain.

Wheeler's Automatic Groover.

We show in the accompanying illustration an automatic groover recently brought out by W. A. Wheeler, Indianapolis Elbow Company, Fort Wayne avenue and St. Clair street, Indianapolis, Ind. It is described as quite new in design, it being operated from the outer end, as indicated in the illustration. The operator can thus handle the work and run the machine without stepping out of his tracks, thereby saving much time. The carriage or sliding head, containing the grooving and seaming down rolls I and J, is brought forward over the work by means of a new device, consisting of a chain and sprocket wheel attached to the crank. A latch, M, pivoted within the sliding head, makes the connection with the chain and brings the head forward when the crank is turned. When the carriage has reached the end of its travel a projecting lug seen near the sprocket wheel strikes the beveled end of the latch, tilting it upward, thus freeing it from the chain and causing it to stop automatically. At the same time and just before the carriage comes to a stop, the pusher rod C strikes the top end of the clamp D, and throws it over simultaneously with the stopping of the carriage. The operator now takes hold of the handle on the side of the carriage with the left hand, and with one finger holding up the latch M, quickly shoots the carriage back to the starting point without moving the crank, thus releasing the work. The latch M is now ready to engage the chain again, which it does when the crank is turned. The automatic groover is designed to groove and roll down at one operation the seams on any kind of tin or sheet iron work, from the lightest tin to sheet iron as heavy as No. 24 gauge. It will groove pipe from 2¾ inches diameter and upward 30 inches long. Suitable rolls are furnished with each machine for the different kinds of work, and they can be quickly changed by simply removing a spring pin from the stud that carries them. The sprocket wheel, which drives the chain, is turned up true and the teeth milled out from the solid. Ample provision is made for adjustment and taking up of wear or lost motion.



Wheeler's Automatic Groover.

New York Trade School.

Thirteenth Annual Commencement.

Last Thursday evening an audience composed of 100 ladies, as many prominent tradesmen and over 500 scholars gathered in the auditorium of the New York Trade School, at Sixty seventh street and First avenue, which was tastefully decorated, to participate in the commencement ceremonies. At 8.30 p.m. President R. Fulton Cutting secured for the speakers a sympathetic audience by his genial welcome and promise that only inspiring speeches would be heard, as every speaker was either an officer or an ex-officer, and a natural leader. He then introduced John Byrns, ex-president of the National Association of Master Plumbers.

Address of John Byrns.

Mr. Byrns began by saying he had attended all of the commencements of the school, and grew prouder each year of the boy who gave up his nights or left his home to become a mechanic. Amid so many happy influences there was sorrow for the vacant chair of the founder of the institution, the late Col. Richard T. Auchmuty. He was present in spirit, however, and the world was better for his having lived. The work that he had started had now become a monument established to a memory that would compare with that other notable American, Peter Cooper. It had been so difficult at one time for the American boy to secure a chance to learn a trade that a great strike had been the result among the plumbers of New York, and he was sorry to see that again a movement was being made to interfere with apprentices.

"The old guard who surround me on the platform fought to a victory then, and are prepared to enter the fight for the boys again. Personally I am opposed to proscription against the American boy, and rather than submit to it I would go down to my Babylon home and raise non-union potatoes. Forty-three years ago I had no such chance as you have, who have had the best instructors in the world. In those days we could do as nice lead work as any of the samples you have shown, but we did not understand the vent, the syphon, and the science of the business, which you have been thoroughly taught. You are now going out to work, and there is plenty of room for you. If you want success, deserve it. I don't want to caution you about stealing lead and solder when I say be honest, but when you contract to give a man an hour's labor, 'render unto Cæsar the things that are Cæsar's.' We have raised plumbing from a mere trade to a profession, and in following it I want you to bring credit to it, to the Master Plumbers' Association of this city, which has done so much for you, to the school, which is an inestimable benefit contributed by a most worthy citizen, and to yourselves."

Presentation of Certificates.

President Cutting then stated that certificates of their proficiency would now be presented and introduced Wm. H. Oliver, who gave to the evening class ten certificates to house painters and 12 certificates to fresco painters and to the day class 13 certificates to house and sign painters.

The Allison Medal.

Every year the pupil who has shown the greatest ability in the various branches of painting is presented with a medal furnished by Wm. M. Allison and this year it was awarded to Nathan H. Larkin, who accepted it with a very graceful speech thanking Mr. Allison, Instructor McGowan and the awarding committee.

John H. McCullagh presented 36 certificates to evening scholars and 21 to day scholars in the carpentry class.

Mr. Cutting then introduced Stephen M. Wright, secretary of the General Society of Mechanics and Tradesmen.

Mr. Wright's Address.

In beginning he stated that he represented no organization of one branch of mechanics, but a society that had labored to uphold the whole mechanical interest of the nation. He stated that the founder of the institution had the aim of freeing the American boy from the opposition to his entrance to the trades, and his success enabled the scholars to reap a great benefit. "In your future enjoyment of the great privilege I caution you from ever interfering with others rising, but rather extend a helping hand to repay the favors you have received."

John Hughes presented 10 certificates to the plastering class, 3 to the stonecutting and 14 to the blacksmithing class.

Thomas J. Tuomey presented 40 certificates to the evening plumbing class, and Edward Murphy explained the amount of study in drawing, bookkeeping and lectures in addition to the manual training that was necessary to secure a trade school certificate, in presenting 114 certificates to the day class in plumbing.

The Trade School Yell

then shook the building, in surprise to all but the boys who gave:

"Zip! Boom! Rah! Hear us roar! Trade school boy of 94! Rah! Rah! Rah! Who are we! Plumbers!—As you all can see! Zip! Boom! Rah!"

Which was followed by a cheer for chief instructor of the plumbing class, John Delehanty, who is held in high esteem by all of the scholars.

President Cutting's Address.

Mr. Cutting stated that he was sorry that ex-Mayor Abram S. Hewitt of New York City was unavoidably absent, as it made it necessary for him to fill the place of a prominent speaker. Once, on being introduced to speak in the place of Chauncey M. Depew, as he arose half of the audience arose also and went out; but here he felt more sure of his audience. He then told how Colonel Auchmuty fought to preserve his country and at the close of the war began another patriotic fight in the interest of skilled labor. Taking as an example the Normans, who invaded England centuries ago and who built churches to establish morals for the country which now stands in the foremost ranks of the world, Colonel Auchmuty had established the trade school to build up skilled labor with a reputation for honesty and industry. "Having learned much here it is natural for you to think you can teach others a great deal, but in your teaching do not neglect to instill integrity into your life and the lives of your associates. Join the unions of organized labor and infuse into them the ideas of liberality and intelligence. They need you as a purifying influence and to teach them that the trade school is a boon to coming men. I now say good-by, commending to you the feeling of fellowship here engendered, and would have you remember that you represent the trade school and its interests. I may never see many of you again but, my interest will follow you always and everywhere. Should we meet again I shall be glad, and again I say good-by."

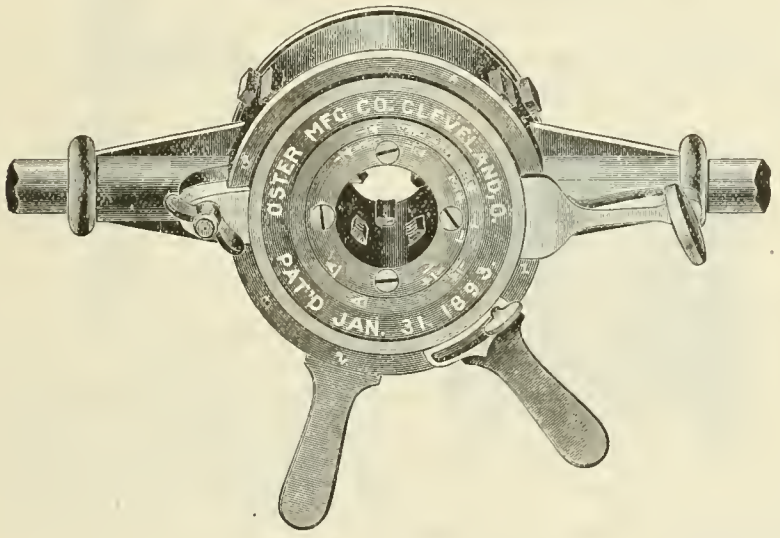
Graduates in Day Plumbing Class, 1894.

Adams, Thomas J., Yorktown Heights, N. Y.
Angell, Richard J., Oxford, Mass.
Arndtstein, Lewis, New York City.
Atkinson, Christopher, Columbia, S. C.
Barnes, Vincent M., Great Neck, L. I.
Barnes, Luther M., Collinsville, Conn.
Barry, Thomas E., Boulder, Col.
Battle, Edward, St. Thomas, Ontario, Canada.
Baum, William F., Bethlehem, Pa.
Beach, Bertie C., Green, N. Y.
Becker, Albert R., New Orleans, La.
Berle, Adam, New York City.
Bitz, Louis P., Port Chester, N. Y.
Blair, Walter H., Westfield, Mass.
Blakeslee, Asahel, Westfield, Mass.
Bohlman, Herman T., Portland, Ore.
Bouque, Eugene F., Moberly, Mo.
Bowron, Fdk. F., Long Island City, N. Y.
Boyd, James H., Chicago, Ill.
Brady, Francis P., Johnstown, Pa.
Brady, Joseph T., New York City.
Bratton, Walter B., Lewistown, Pa.
Bray, George S., Hazelton, Pa.
Bryant, Nimrod, Edwardsdale, Pa.
Buck, Emmer, Knoxville, Pa.
Clarke, James F., Lewistown, Pa.
Craigie, Charles E., Lancaster, N. H.
Crane, Henry W., Elizabeth, N. J.
Custer, Allen E., Bridgeton, N. J.
Danenfelser, George, Westchester, N. Y.
Darling, Jr., Albert M., Riverhead, N.Y.
Dent, William J., Skaneateles, N. Y.
Doolittle, Elmer B., New Rochelle, N. Y.
Dougherty, Charles O., Altoona, Pa.
Dunn, William A., Newark, N. J.
Edgar, John M., Hyde Park, N. Y.
Edgar, William, Hyde Park, N. Y.
Engel, John J., Elizabeth, N. J.
Enright, John H., West Point, N. Y.
Fay, Herbert, Plantsville, Conn.
Fender, George, New York City.
Finigan, John, Paterson, N. J.
Fisher, Harry J., Pottsville, Pa
Foster, Harvey N., Waterbury, Vt.
Foster, Luther E., Claremont, N. H.
Foster, William G., Pittston, Pa.
Foulois, William H., Washington, Conn.
Frain, Edward, Passaic, N. J.
Garvin, Peter J., New York City.
Gilligan, John J., Wilkes-Barre, Pa.
Goetchins, Maxwell V., Tower, Minn.
Hahn, Alvin W., New York City.
Harris, John A., Plymouth, Mass.
Hart, Jr., Albert, Pearsalls, N. Y.
Haug, Frederick, Brooklyn, N. Y.
Hawkins, Thomas W., Tottenville, N. Y.
Hawthorne, Ralph W., Elgin, Ill.
Hayden, Frank E., Cassopolis, Mich.
Higby, Charles H., Port Jervis, N. Y.
Ingalls, Richard, Lowell, Mass.
Jenks, George C., Goffstown, N. H.
Johnson, Ossian, New York City.
Juergens, William J., Wheeling, W. Va.
Kenney, Albert F., Salem, Mass.
Kennely, Martin, East Winsted, Conn.
Klenke, Theodore A., New York City.
Kuhls, Charles L., College Point, L. I.
Lang, Edward W., Louisville, Ky.
McCollum, George B., Oil City, Pa.
McManamy, John, Lancaster, Ohio.
Moriarty, Patrick J., South Hadley Falls, Mass.
Morton, Reginald, Chiltonville, Mass.
Müller, Guido, Brooklyn, N. Y.
O'Hanlon, Charles J., Savannah, Ga.
O'Hara, Tracy, Paterson, N. J.
Otto, Jr., Fred. W., Peekskill, N. Y.
Petersen, William, Hoboken, N. J.
Pinchbeck, George A., New York City.
Pulte, William J., Grand Rapids, Mich.
Quicke, Thomas J., West Point, N. Y.
Reese, Jay W., Cazenovia, N. Y.
Recker, Frank L., Altoona, Pa.
Redfield, Charles H., Sag Harbor, L. I.
Regan, Frederick, St. Stephen, New Brunswick, Canada.
Rhoads, George M., Reynoldsville, Pa.
Royce, Eugene, Avon, N. Y.
Rutledge, Pearl B., Bellefontaine, Ohio.
Ryan, William A., Hamilton, N. Y.
Sargent, Edwin F., Haverhill, Mass.
Seelig, George W., Buffalo, N. Y.
Semler, Joseph R., Newburgh, N. Y.
Solomon, Thomas H., Jermyn, Pa.
Soult, George H., Lewistown, Pa.
Sullivan, William E., Ridgefield, Conn.
Sullivan, George J., New York City.
Trexler, Frank H., Williamsport, Pa.
Tryon, Thomas L., Elizabeth, N. J.
Tucker, Oliver M., Newark, Ohio.

Updegrave, J. Frank, Johnstown, Pa.
Vegiard, Charles E., Scranton, Pa.
Vincent, William H., East Hampton, L. I.
Volckening, Frederick W., Brooklyn, N. Y.
Von Lunen, George, Johnstown, Pa.
Von Beck, John M., Carbondale, Pa.
Walter, Ernest, Toledo, Ohio.
Weed, John F., New York City.
Wharen, Harrison C., White Haven, Pa.
White, Alfred J., Los Angeles, Cal.
Williams, W H , Larksville, Pa.
Wood, Roy O , Bedford, Ohio.
Woodruff, Joseph W., Elizabeth, N. J.
Wrench, William C., Montclair, N. J.
Yeager, Ezra K., Natalie, Pa.
Zinn, George, Hackensack, N. J.

The Oster Adjustable Die Stock.

The cut shown herewith is of an adjustable die stock offered by the Oster Mfg. Company, Cleveland, Ohio. The tool is for hand use for threading pipe and bolts, one stock threading from four to six sizes. It is stated that the stock is made of a new process metal, many times stronger than steel in breaking quality, and that the dies are a special brand of fine steel, strong and durable,



The Oster Adjustable Die Stock.

and that they may be sharpened on a grindstone. It is explained that large pipe can be easily threaded by taking two cuts; that a cut off may be included if desired, combining two tools in one—threading and cutting off; that there is no waste of material, and that oil holes give an opportunity of oiling the dies while in use. The manufacturers claim that the stock is self centering, making a perfect thread every time; that in use no turning back over threads is necessary; that the stock is instantly adjustable and removable; that the adjustable positive stop enables the operator to thread any number of pieces of a given size without resetting, and that the device for holding the cams in position while threading is positive and warranted not to slip. The dies and guides are operated by a cam movement, having suitable handles to enable the operator to easily adjust them to any desired size. The tool is made in six sizes, for pipe from ⅛ to 4 inches. Stocks cutting from 1½ to 4 inches have four handles; other sizes have two handles.

The last Wisconsin Legislature enacted a law doing away with the three days' grace on promissory notes, the law to take effect April 5 of this year. There has been considerable doubt as to what effect the law would have on paper issued on or before April 5. Last week the bankers of Milwaukee issued the following: "By advice of counsel in whom we have full confidence, the banks of Milwaukee have concluded that the law abolishing the days of grace in Wisconsin will take effect and be in force April 6, 1894. We conclude that the act applies to negotiable paper issued on or after April 6, 1894, and not to paper executed prior to that date. We do not believe that the law can apply to negotiable paper in existence at the time it was passed, because it would impair the obligation of the contract; nor to negotiable paper executed prior to April 6, 1894, because it does not take effect until that date, and there are no words evincing any intent of the Legislature to make the act retroactive."

The Uniform Bill of Lading.

The Philadelphia *Manufacturer* calls attention to the victory just now won by the National Transportation Association (an association of shippers) in a contest with the railroad companies against a proposed invasion of shippers' rights. The railroads lately prepared a uniform bill of lading, which they tried to compel the public to accept. This bill of lading contained many clauses of an unfair character, as, for example, one that relieved the transportation companies absolutely from all liability for goods damaged or destroyed by the negligence of the companies' servants. It also had printed across the face of it in large letters the word "non-negotiable," and it made new classifications of freights directly to the advantage of the carriers and against the advantage of shippers. Well-informed persons have fully understood that a bill of lading of such a kind will not stand the test of submission to a court of justice. But the great mass of shippers are not well informed, and the usefulness of such a formidable document to the companies lay in the fact that it might be used to frighten and discourage ignorant, timid and poor men from pressing just claims against the companies.

The attempt to force this bill of lading into use was resisted by the National Transportation Association, of which the Manufacturers' Club is a member. That body protested to the railroad companies; but it did much more. It presented the matter to the Inter-State Commerce Commission backed by 40,000 signatures to an appeal for protection, and it even carried the case into Congress in a petition for legislation which shall make this kind of thing impossible for the future. A speedy consequence of all this active effort has been that the Chicago & Grand Trunk Railroad Company have announced at Chicago that they, for their part, withdraw from the attempt to impose on the public, and repudiate the proposed uniform bill of lading. The company have prepared a bill of lading of their own, containing a small amount of matter, phrased in plain language, and declaring themselves "subject to carrier's liability under the common law in force in the various States, Territories, Provinces, or foreign countries through which the goods may pass."

This is enough for any carrier who proposes to deal fairly with its clients. For in any case, no matter what the bill of lading may say, such matters are governed by law and are always disposed of in accordance with law when a shipper who has had damage has persistence enough to seek justice resolutely, without regard for restrictions and conditions put upon him by the carrier. The time has not yet come when American legislation will relieve public transportation companies from responsibility for valuable material intrusted to their care and for the movement of which fair prices have been paid.

The action of the Grand Trunk Railroad Company will probably cause the abandonment of the uniform bill of lading by all the companies. Competition for business is too eager to permit one line to have the advantage bid for by this concession to indignant public opinion.

The brown prismatic powder furnished by the Duponts for use in the trial tests of the 13-inch gun did not prove as powerful as expected, so that the range test of throwing the 1100-pound projectile 10 miles will not be made until a better quality of powder, having greater velocity, is provided.

Ocean steamship lines report that the number of immigrants booked by them this season is 60 per cent. less than at this time last year, and official figures show that the number entering the port of New York during the past three months was 17,767 less than in the corresponding period of last year. Dull times and strictness in enforcing the immigration laws are credited with this decline.

The recent action of the Superintendent of Canals, under authority of the New York State Legislature, in granting an exclusive 50-year contract to the Cataract General Electric Company for the transmission of electricity along the banks of the canals of the State, with the right to supply light and power not only for use on the canals, but in all the adjacent territory, has raised a storm of indignant protest in several quarters.

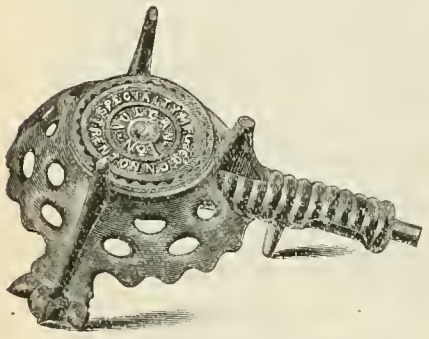
There is said to be a movement on foot among the paper manufacturers of the United States toward a great national combination, or pool, of all the mills.

Terence V. Powderly has filed a claim against the executive board of the Knights of Labor for back salary as General Master Workman.

THE RETAIL STORE.

Vulcan Gas Burner.

The Specialty Mfg. Company of Trenton, N. J., through their selling agents, James R. Steers & Co. of 42 and 44 Broad street, New York, are putting on the market the gas burner or stove shown in the accompanying cut. The burner is intended for use in bedrooms or other places where a quiet and powerful heat is required for heating water or other purposes. It consists of a malleable iron frame or stand, having a removable center piece or burner made of the same material. The supply connection is simply a pointed tube which screws into the sleeve and allows of a piece of rubber tubing being slipped



Vulcan Gas Burner.

over its outer end. The pointed supply tube connects with a passage in the sleeve of the stand and thus allows of the passage of gas to the point of combustion. Provision is made by means of the screwed supply tube for the combination of air with gas, and the combination may be regulated by screwing the tube in or out so as to get the most efficient combustion. The burner consumes but 3 feet of gas per hour, and it is claimed that the pressure required is so slight that the tubing conveying the gas may be placed over the ordinary jet burner without removing the tip. There is no gauze in the burner, and nothing to break or give out. The burner is of neat appearance, light in weight, and occupies very little space. The makers claim that it will heat a quart of water in four minutes, and is easily adjusted to any gas pressure, a turning of the supply tube until a blue flame results being all that is required.

The McKim Patent Measure.

We show in the accompanying illustrations views of the McKim iron bottom ½-bushel measure being put on the market by the Bellaire Stamping Company, Harvey, Ill. Fig. 1 is a general view of the measure, while Fig. 2 shows it with side wall cut away, revealing the top finish and the method of joining on the bottom. Special emphasis is laid upon the fact that it is made of solid steel, the bottom being fastened mechanically in a slot. This slot is formed in an ingenious manner by a series of folds in the bottom of the measure, which can be clearly seen in Fig. 2. The bottom is further strengthened by a metal foot riveted to the center of the bottom

The McKim Patent Measure.—Fig. 1.—General View of Measure.

plate, which prevents the bottom springing down, however great the pressure upon it. The measures are made of a

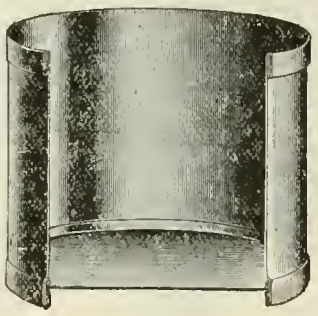
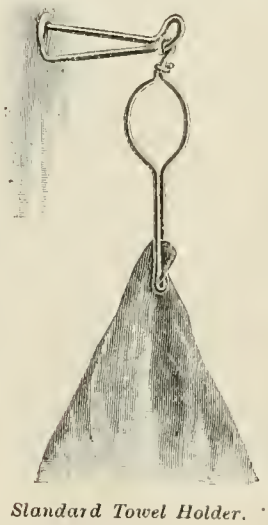


Fig. 2.—Measure with Side Broken Away.

heavy gauge of metal and are thoroughly painted.

Standard Towel Holder.

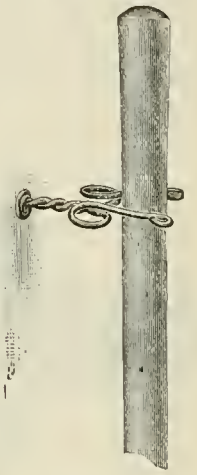
Hamblin & Russell Mfg. Company, Worcester, Mass., are putting this article on the market. It is represented in the illustration herewith given, which indicates its construction and the manner in which it is used. The holder consists of two parts, each of which is made of one continuous piece of steel wire. One of the parts is screwed in the wall or partition, the other part or holder proper being suspended from it. The holder is neatly nickeled.



Standard Towel Holder.

Standard Broom, Brush and Tool Holder.

This device is being put on the market by the Hamblin & Russell Mfg. Company, Worcester, Mass., and is shown in the accompanying illustration, which represents its shape and use.

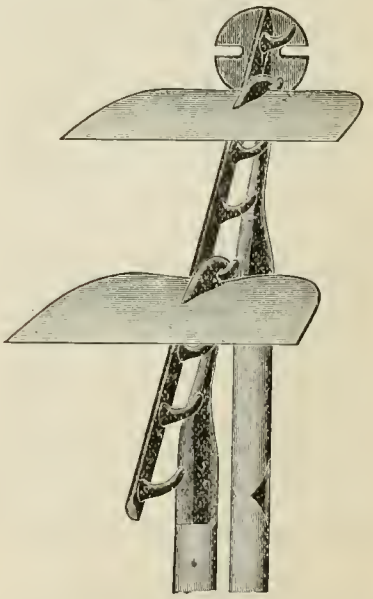


Standard Broom, Brush and Tool Holder.

The holder consists of two steel wires which are twisted together in the manner shown. The end of one of the wires is threaded to act as a screw in securing the holder in place. The holders are made tinned and nickeled.

The Hager Hoe Bracket.

The cut here shown represents a hoe bracket being introduced by John N. Hager, Fort Atkinson, Wis. The



The Hager Hoe Bracket.

bracket is provided with eight hooks, and is described as convenient for hanging up the hoes or taking them down without one hoe interfering with any of the others.

STOVE TRADE NOTES.

The Local Stove Trade.

The stove trade in New York and vicinity during the month of March showed a decided improvement over that of February, and more nearly approached the normal volume than at any time for five or six months past. The atmosphere in the wholesale houses was more charged with business; there was more general activity in nearly all departments; more correspondence, more requests for quotations, more callers from among the dealers, and the quiet and hush that characterized the first two months of 1894 in the stove business and made the business days more like a succession of Sundays was gone—it is hoped never to return, while with the dealers themselves there was less gloom, and instead of the almost automatic shake of the head when the salesman called there was something they needed and ordered.

The repair business, which naturally commenced last fall to increase when the traffic in stoves declined, is now falling off, due largely, of course, to the departure of cold weather, but likewise due in part to a return of confidence among those who can afford to throw the old stove away and purchase a new one. There is nothing in the present increased demand to encourage any hopes of an approaching boom, and nothing to warrant the expectation of large dividends at the end of the year in the stove line, for prices are low and have been cut to an unprofitable point. Many sales have been effected by wholesalers accepting offers made by dealers who know what a bargain is and can afford to hold the goods awhile if necessary. Some orders, too, have been complimentary to the drummers, and did not indicate particular revival of trade with those who gave them. Again, a large percentage of the output of local foundries for March was made on orders from abroad and for new buildings, still leaving, as will be seen, a limited local demand for the smaller portable cooking constructions. But in this line improvement was also noted, and city dealers ordered by the dozen, instead of one or two at a time, as they had been doing since December 1.

The deficiency in demand appears to be settling down to the actual point where the non-employment of working men—those who depend for a living entirely on daily wages—affects trade, and shows less timidity among the middle classes and those who have money saved. This is apparent from the orders, postponed for many months, that are being placed to renew or alter furnaces or heaters or for other changes in the heating plants in private residences.

The most encouraging sign that the revival is genuine and will soon reach the poorer classes, naturally the last to benefit by a return to prosperous times, is the fact that renewed activity in building is taking place in the cities hereabouts on a satisfactory basis, even better than has existed for two or three years past. Many well-known representative and monied men who have been missed from the field for two years or more are making their reappearance and preparing for large operations. The architects' tables are full of plans, the builders' mercantile agencies are becoming active with inquiries about builders whose past records are gratifying to those who inquire, and the agencies are receiving many visits from regular builders who call to announce their intention of undertaking building operations and to make statements of their financial condition.

The speculators are relegated to the rear and an era of healthful prosperity in this line seems at hand. As it is the great mainspring of business, it contains great encouragement and must give employment to thousands of men whose demands on the stove dealers as well as many others will soon compel the employment of other mechanics to supply their wants. Thus the snowball of trade is started on its way, growing in circumference with every turn.

The reason for this activity in building when commercial business generally is but just emerging from such great prostration is plain, for builders realize that values cannot be much lower than at present, and no more favorable time could be expected in which to make contracts. The effect of tariff changes has been discounted and competition from worthless speculative builders is not to be feared. While some materials may go a little lower, everything has nearly touched bottom, and with the last decline reaction is sure to come and the rebound would carry prices above the present market.

It must be borne in mind that the weather during March was very favorable to business, and some portion of it may have been borrowed from April, so that the volume of business this month may be somewhat disappointing, but the fact remains that city trade is on the up grade, and combining the months of March and April, a smaller percentage of decline compared to the same months of 1893 will undoubtedly appear than a comparison for two years of a combination of January and February would show. Very few new patterns of ranges have been brought out this spring, and under the circumstances but few were expected by the dealers.

SIFTER.

The Art Stove Company

of Detroit, Mich., have just issued from the press a new catalogue which is a credit to their taste and understanding of what dealers require in the way of trade literature. It is substantially bound in board covers, is printed in black upon a good quality of calendered paper and is of a size and shape to facilitate reference. The edges of the pages are tinted in a color to form a pleasing contrast with the shade of the cover. The opening pages are given up to various matters of general and specific interest to the dealer, while the body of the work contains illustrations and descriptive matter relative to several lines of new goods. Among the latter may be mentioned the Laurel steel range, embodying the latest improvements and made in a variety of styles and sizes; the Home Laurel six-hole range, made for hard or soft coal, coke, wood or natural gas, and the Family Laurel range, made with four and also with six boiler holes. These goods are referred to as first class in all respects and as embodying those features which render them satisfactory in operation. The ornamentation is of a high order of merit, the nickel plated portions forming a pleasing contrast with the black iron surfaces. In the way of cook stoves the company have added to their assortment the Family Laurel, a four-hole construction provided with duplex or shaking and dumping grate, new and improved hearth, patent oven door opener, large ash pan, ventilated oven and interchangeable reservoir, so that a square stove can be converted into a bracket reservoir stove if desired. The Peerless Laurel six-hole wood range is another new line which the company have brought out in a variety of styles and sizes The makers refer to the Peerless Laurel as "one of the most complete lines ever offered in wood burning ranges, constructed in such a manner as to give the highest possible results." A number of pages are also given to heating stoves known under such names as Radiant, Novelty, the Parlor Laurel, the Oakland, the Cannon Laurel, the New Oak, Monarch Laurel and the Cottage Laurel. The catalogue closes with illustrations of an interesting line of oil heating stoves known under the names Art Laurel and Combination Laurel, followed by a line of improved lamp stoves. The catalogue is neatly arranged throughout and closes with an alphabetical index. The company are doing a good business in their specialties and state that they are running their works full capacity.

ODD PLATES.

SOME OF THE NEW THINGS of the Boynton Furnace Company, 207 and 209 Water street, New York, are the Lakewood range and the Revertible Flue Steel Dome furnace. The range is of the double oven variety and presents a handsome appearance with several attractive features. The bottom plate is of cast iron, having the flue strip as part of it, and can be lifted out, so that the flue can be readily cleaned. The bottom of the oven flue is covered with a non-conducting coating. The water back bears a label stating that it has been tested so stand 100 pounds pressure, and is novel in shape. It lies at the back and inclines toward the front, and extends for a short distance along each side of the fire chamber. A revolving grate and an ash sifter below makes a convenient fire chamber equipment. The range is furnished with either a handsome base or a hot closet under each oven. A nickeled front hearth in one piece extending across the range is a new ornament. The furnace has a substantial base, a capacious ash pit and a lever shaking center dump grate. A cast

iron fire pot supports a large steel dome of heavy plate and gas proof construction. From the sides of the dome two indirect draft columns of steel plate turn down and connect with a crescent shaped flue at the bottom. This crescent flue has at the back another steel column, which connects at the top with both the smoke pipe and the steel dome, a damper in the connection making the furnace either direct draft or revertible flue. A connection between the crescent flue and the back of the ash pit controlled by a damper affords an efficient dust flue and check damper. The casing rings are made for the use of an inner and outer casing.

THE UNION IRON WORKS of Spokane, Wash., contemplate adding a new and larger size to their line of box heating stoves, intended for use in country school houses and railway stations. The following squib is from a local paper of recent date: "Owing to the non-payment by the city for the heat supplied by the Hotel Spokane to the Mining Exchange the steam was turned off recently, much to the discomfort of the visitors and those engaged there As there seemed no chance of an immediate settlement of the trouble Harry E. Curtis, proprietor of the Union Iron Works, kindly donated a large stove to the exchange, and the mercury has again risen to a comfortable degree. The stove donated is a simon pure Spokane product, and is as good a heater as is made in any other part of the country, being especially adapted to heating offices."

JOHN F. BANNON, assignee of the Security Gas & Vapor Stove Company of St. Louis, Mo., has recently disposed of the property to L. B. Jones, who, we understand, intends, with a large working capital, to immediately put the plant into active operation. It is stated that the property sold for more than enough to pay 100 cents on the dollar to the creditors, thus leaving something for the stockholders. It is intimated that Mr. Jones will erect a large factory on the line of the railroad, and thus be in a position to enjoy exceptional shipping facilities.

THE FLORENCE STOVE WORKS at Florence, Ala., were sold on Thursday, March 22, by the trustee of the old land company to H. Thoele and associates. We understand the plant will be put in good condition, and as soon as the work is completed will be actively operated.

THE KEELEY STOVE COMPANY of Columbia, Pa., commenced on Monday, March 26, running five days in the week. For some time past they ran but three days in the week.

THE CORNING STOVE WORKS, located at Corning, N. Y., are now in full operation and running full time.

THE BRAMHALL DEANE COMPANY of New York City were incorporated last week, with a capital of $300,000, for the purpose of manufacturing cooking, heating and ventilating apparatus. The directors are Royal E. Deane, George G. Brooks and George Rawlins of New York City.

THE ROGERS STOVE FOUNDRY, at Belleville, Ill., resumed operations on Tuesday, March 27.

THOMAS FLETCHER, the well-known English manufacturer of gas stoves, in reply to some adverse criticism, writes to the *British Medical Journal* relative to cooking by gas. Among other things he says that for heavy and continuous use, both fuels being used with equal economy, 1 pound of coke or coal is equal in heating power to about 19 cubic feet of ordinary coal gas, the actual comparative cost depending upon local prices. For irregular work, such as cooking, he says that gas is in price a far cheaper fuel than coke or coal.

THE DANGLER STOVE & MFG. COMPANY of Cleveland, Ohio, have recently issued from the press a very attractive catalogue of the Dangler gas stoves and ranges for the season of 1894. The frontispiece consists of a bird's eye view of the company's works, followed by an announcement to the trade in which it is stated that during the season of 1893 their business showed a very large increase over that of any previous season. The 48 pages of which the catalogue consists carry illustrations of a varied line of gas burning appliances adapted for heating and cooking purposes. The descriptive text is of such a character as to inform the dealer as to the special features embodied, while the engravings are specially fine. Cabinet gas ranges, shown with and without connections for hot water boiler, occupy the early pages, following which are junior stoves, hot plates, ovens, burners, water coil attachments, &c. The Dangler radiator occupies several pages, as does also the Dangler cylinder heaters. The little volume is carefully arranged, neatly printed and bound in colored paper covers, with side title embossed in black and old gold. A telegraphic code is a valuable feature of the work.

THE MOUNT PENN STOVE WORKS have purchased the stove business of George Uniacke, 111 and 113 North Second street, Philadelphia, formerly carried on by Thos. Holt, and more recently by Naylor & Uniacke, and will in future conduct it in their own name, carrying a complete line of goods. They propose also to keep in stock the usual line of stove dealers' goods, including gas, gasoline and oil stoves and ranges, vapor torches, plumbers' soldering pots, refrigerators, hollow ware, tinned and enameled ware, farmers' boilers and kettles, mica, stove polish, fire brick and furnace and stove repairs. The store will be in charge of George Uniacke.

WM. HIGHTON & SONS, 55 Charlestown street, Boston, Mass., have taken the agency for the line of furnace fittings made by the Excelsior Steel Furnace Company, Chicago, and in addition to a full line of samples will carry an assorted stock, a feature of which will be oval goods to suit that market.

SECRETARY JOHN A. HAHEN of the Excelsior Steel Furnace Company of Chicago was in New York this week calling on the trade in the interest of their line of furnaces.

WE ARE INDEBTED to the Eclipse Stove Company of Mansfield, Ohio, for a copy of a neatly arranged catalogue illustrating and describing their Premier Eclipse six-hole range. This stove is of substantial appearance, handsome ornamentation and embodies the latest improvements. The castings are described as smoothly finished, the fitting first class and the trimmings of a high order. The range is made two sizes for wood and two sizes for coal or wood. The engravings in the pamphlet are well executed, clearly showing the features of ornamentation, while the descriptive text is of such a character as to give the dealer all necessary information. The last page of the pamphlet contains a request to those interested to write for a copy of their catalogue and discounts on their entire line of Eclipse stoves and ranges.

A CITIZEN OF WESTERN PENNSYLVANIA, residing in Sharon, recently ordered a stove from the foundry in that place, presumably that of Graff & Co., proprietors of the Sharon Stove Works. The customer was somewhat in a hurry for this piece of kitchen furniture, but desired it made especially for him and a record kept of the time consumed from the melting of the pig iron to the starting of the fire in the stove for cooking purposes. The order was taken, the pig iron melted, the cast made, the parts assembled, put together, polished, and the stove delivered at the house of the purchaser in just six hours from the time of beginning operations.

OUR READERS will remember that some time since we mentioned in these columns the fact that a relief fund had been started in the city of Detroit for the needs of the worthy suffering from the extreme business depression. It was also stated that a leading spirit in the movement was George H. Barbour, well known from his connection with the Michigan Stove Company. In a recent issue of the Detroit *Free Press* is presented a detailed statement showing the collections and disbursements, and the manner in which the fund was distributed. The receipts amounted to over $11,000, most of which was distributed by checks to the superintendents of associated charities.

WE HAVE BEFORE US a photograph of the interior of the salesroom of Sam S. Utter of 113 Beekman street, New York City. The picture shows the arrangement of the cast iron stoves and ranges, as well as that of an extensive line of oil cook stoves and heaters, in which Mr. Utter has built up a large and profitable business. Casting about for the owner of the establishment, we find him standing in the background of the picture, one hand resting upon the top of a cook stove while the other is partially inserted in his trousers pocket. The silk hat occupies its customary poise and beneath it beams the face of the genial Sam. Accompanying the photograph we have a folder for 1894, relating to the Beauty and New Beauty oil stoves. These are made in different styles and sizes, are neatly finished in nickel plate and japan and embody features of construction which have established for them a wide and growing popularity.

THE CRAIG-REYNOLDS FOUNDRY COMPANY of Dayton, Ohio, are offering the trade a new furnace known as the Triumph. It is carefully constructed in all its parts, has sectional porcupine fire pot, thus enabling the anti-clinker grate to be easily removed when desired, improved dust damper and other features on which the manufacturers base claims to superiority. The company refer to the durability, economy and cheapness of the heater, and feel confident it will prove popular with the trade.

PENINSULAR STOVE COMPANY are distributing from their Chicago office a circular stating that they are prepared to furnish customers with all kinds of stationery, the letter heads, bill heads, &c., having a lithographed heading as shown on a sample sheet which they inclose. The sheet also indicates the quality of the paper used, the dimensions of the various kinds of stationery

which can be supplied, and the prices for the same in 500 and 1000 lots.

It is reported that wages have been restored at Wood, Bishop & Co.'s foundry at Bangor, Maine.

The Schaab Puff Stove Company of 519–521 Locust street, St. Louis, Mo., have issued their first catalogue illustrating and describing the Empire stoves and ranges, which they manufacture. The steel range made under this name is constructed in a substantial manner, embodying the modern improvements, and is offered in several sizes. It is shown in the catalogue with and without connection with hot water boiler. The company also call attention to the Prize Empire four-hole coal range, the Home Empire four-hole cook, adapted for burning coal and wood, the Popular Empire four-hole cook stove, the Prize Empire wood range, the Farmer's Pride wood cook, and the Hero. The heating stoves include the Radiant Empire, Oak Empire, Floral Empire, New Twilight, Telephone and the Rose. The company are general agents for Dangler gas and gasoline stoves, Palace King furnaces, North Star refrigerators, as well as various lines of hollow ware, &c.

Edward Carton, president of the Carton Furnace Company, Utica, N. Y., was a visitor in New York City this week.

The Novelty Mfg. Company of Jackson, Mich, have brought out an entire new line of oil cooking stoves for the season of 1894. The line is put on the market under the style of Splendid oil cooking stoves. They resemble in appearance some styles of gasoline stoves, having a steel frame supporting a square steel top of commodious size, in which are inserted the usual cooking grates. The lamp is supported in the lower part of the frame work, while the reservoir is made in the shape of a horizontal cylinder, holding ½ gallon of oil, and located at the rear of the burner, so far from the lamp that it is impossible for the oil to become heated. The No. 1 stove has a single 8-inch circular burner, and is 16 inches high. The No. 2 stove has two 8-inch circular burners, with a ¾-gallon reservoir, and also stands 16 inches high. The No. 220 has two 10-inch circular burners, with a 1-gallon reservoir, and is 30 inches high. The No. 235 stove is a three-burner step stove, having two 10-inch burners and one 15-inch burner for the step. It is supplied with two polished brass horizontal tanks, each holding a gallon of oil. The hight of this stove is 30 inches. It is of large cooking capacity, to meet the requirements of a large family. These stoves are fully illustrated and described in a neat catalogue just issued, which also contains illustrations and descriptions of the Ruby round wick lamp stove and the Twin Ruby.

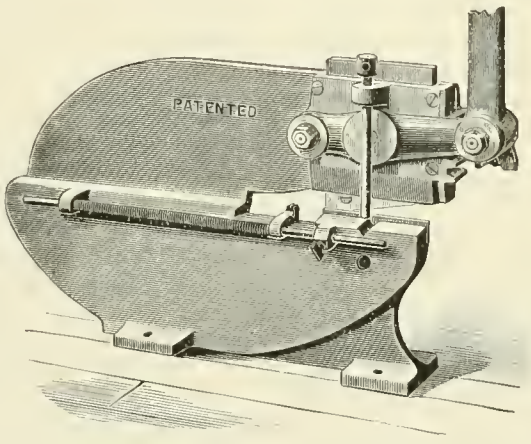
The Ingersoll Mfg. Company of Lansing, Mich., are manufacturing a lamp stove of original design which they style the Magic Room Heater. It consists of a 300 candle power lamp, mounted in a light but strong skeleton frame, which supports overhead a drum of Russia sheet iron. Inside the drum is a double cone made of thin strips of metal of a total length of 500 feet, which is termed the Ingersoll heat battery. The statement is made that with the use of this battery the heating power of the lamp is greatly increased. The heat strikes the lower apex of the cone and is rapidly absorbed by the radiating and intercommunicating strips of metal forming the battery until every part of it becomes heated, and every interstice forms an air duct or pipe through which a strong upward air current is induced which is the full size of the drum, 10 inches in diameter. The manufacturers estimate that in about six minutes a volume of air equal to the contents of a room 16 x 16 feet will pass through the battery. A grate at the top enables the lamp to be used for cooking. It furnishes light at the same time. The parts can easily be lifted out and used separately. The extreme hight of the stove is 30 inches.

The Michigan Stove Company have issued a very pretty catalogue of their Oak-Garland line of heating stoves for hard or soft coal or wood. This catalogue is printed on super-calendered paper in black and red ink, has an illuminated title page, is tied with blue silk cord and consists of 12 pages. The stoves illustrated and described are the Oakdale-Garland, an elegantly designed all cast stove, with both direct draft and reversible flue; the Syphon Oak-Garland, a base heater of original construction, giving a return flue to a boiler iron stove, and specially designed for keeping a fire of soft coal; the 1894 Oak-Garland, for any kind of fuel, in four sizes, furnished with a patented cut off grate when used for wood; the Horizontal Oak-Garland, for wood, with direct draft and revertible flue; the Oak Pennant, a lower priced boiler iron stove, intended for any fuel and made in seven sizes. The Michigan Stove Company's line, it will be seen, is so extensive as to cover every requirement for an oak stove. It embraces stoves adapted to every kind of fuel, even including chips and hay. All tastes are considered, from those who desire the most ornate constructions, rich in nickel and fine carving, down to those who are looking for something reasonable in price to compete with cannon and box stoves. It is unquestionably a magnificent line, as stated in the catalogue.

The many friends of Washington M. Shaddinger, secretary of the Detroit Stove Works, will be pleased to learn that on the 2d inst. he was united in marriage to Florence B. Borgman at Detroit, Mich. Our genial friend Shaddinger had appeared to be proof against the attractions of the fair sex, and the step he has taken is strong evidence that he must have at last encountered a lady of superior charms and far more than ordinary graces. The happy couple are "at home" at the Lexington Hotel, Chicago.

The Conqueror Sheet Iron Shear.

This shear is so designed that pieces of any length can be cut, and that the piece cut off will not bend up, but will be kept straight. This is made possible by the peculiar form of the frame, the upper half of which is set over so that it is not in line with the lower. This provides an unobstructed passage for the edge of the sheet in line with the knives. The piece being cut off also has a free passage in line with the knives on the opposite side of the frame. By referring to the engraving there will be noticed on the side of the frame, and parallel with the knives, a rod upon which is coiled a spring. This spring acts upon an arm which is free to slide on the rod and which is forced toward the knives by the spring. The arm is designed to enter between the sheet and the piece cut from it and to thereby slightly separate the two. It is evident that the thickness of the metal being cut will control the position of the arm, it being nearer the knives when the sheet is thin. The upper knife is actuated by a lever to the free end of which is attached the handle, in the end of which is a segmental gear adapted to engage a rack in the frame. This construction is extremely simple and provides ample power. This machine is made in two sizes by Chas. G. Eckstein & Co. of 41 John street, New York. No. 1 will shear $\frac{5}{32}$-inch sheet iron and has knives 5½ inches long; No. 2 will shear 1¼-inch sheet iron and has knives 6 inches long.



The Conqueror Sheet Iron Shear.

The number of vessels passing through the Suez Canal last year was 3341, as against 3559 in 1892. Of these 2262 were under the English flag. The time of transit through the canal has been gradually reduced of late years, since the aid of the electric light for night navigation has been introduced. The average length of passage last year was 20 hours 45 minutes per vessel. In 1891 and 1892 it was 23 hours 31 minutes and 21 hours 16 minutes, respectively.

The latest estimate of the mint bureau places the production of gold throughout the world in 1893 at $150,000,000. In 1892 the production was $138,860,000.

TRADE REPORT.

The Iron Market.

The condition of the market seems to be precisely as noted in our last. Manufacturers and dealers report a good inquiry and somewhat larger sales, but unfortunately that about exhausts all the favorable features. Prices are easier, and, in fact, lower on Pig Iron, while there is no perceptible improvement in Billets and Finished Material. This hardly bears out the statement that the market is better, although there is reason to believe that the tendency is in that direction, and with anything to give it a start the movement might become one of great activity. For the present, however, there is no disposition to buy anything that can be postponed until a later date, so that it will evidently require something sharp and decisive before consumers can be induced to abandon their hand to mouth policy.

The reduction in freights from Southern furnaces to points north of the Ohio River, amounting to 50¢ @ 65¢, has allowed Southern furnace agents to crowd their prices down further. To some extent, however, the reduction had already been discounted.

Pig Iron.—The New York market is quiet. The great battle ground at the present seems to be the New England market, where Virginia, Alabama, Mahoning and Shenango Valley, Eastern Pennsylvania and Buffalo furnaces are fighting for their share of the market. As yet freights from Southern furnaces to New England and to tidewater points are unchanged, but the drop of 50¢ to other sections is supposed to indicate a similar reduction to this section. Among the Cast Iron Pipe contracts about to be closed is one for about 4000 tons for Syracuse, 1500 to 1800 tons for Buffalo and 600 to 800 tons for Niagara Falls. We quote standard brands $12 75 @ $13.50 for No. 1; $12 @ $12.50 for No. 2, at tidewater. Southern Iron, same delivery, $12.25 @ $13 for No. 1; $11 @ $11.50 for No. 2; $10.75 @ $11.25 for No. 3; $11 @ $11.25 for No. 2 Soft, and $11.25 @ $11.50 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10.25 @ $10.75.

There has been a pretty fair demand for Pig Iron in the Philadelphia market, but the increased output furnished more than a full supply, the result being somewhat lower prices for all descriptions. Foundries are gradually resuming work, but at best the consumption does not average more than 50 to 60 % of what is usual at this season of the year, so that there is still plenty of margin for improvement. Among the curious changes noted in regard to the Pig Iron trade is the practical withdrawal of the Alabama furnaces from this market, and the increasing competition from Central and Western Pennsylvania. The last mentioned appear to control prices entirely, and furnaces that are unable to compete have no alternative but to stand aside. Quotations vary considerably, but as a rule delivered prices for Philadelphia and equivalent points are about as follows:

Standard No. 1 Foundry X	$12.75 @	$13.25
Standard No. 2 Foundry X	12.00 @	12.50
No. 2 Plain	11.00 @	11.25
No. 1 Soft	11.75 @	12.00
No. 2 Soft	11.00 @	11.25

Our Chicago agent reports that another disturbance has occurred in that market in the sudden reduction of freight rates on Southern Pig Iron to the Chicago market to $3 ℔ ton from the Birmingham district. This rate is very much lower than anything ever before known. It at present applies only to the immediate vicinity of Chicago, but dealers expect that, as usual, it will very shortly be made to apply to other points which have hitherto taken Chicago rates. Prices were immediately affected by the reduction, but they have not so far led to much new business. The reductions made in the price of local Irons have not been so great as on Southern, because a part of the drop had been previously anticipated. The bulk of transactions during the past week was as usual in locations in which a moderately active trade was reported, with considerable inquiry indicating an early expansion of business. Consumption is steadily increasing. The largest sale of Lake Superior Charcoal reported during the week was one of 500 tons at private terms. Freight rates to this point from Northern Wisconsin have, curiously, been advanced 25¢ ℔ ton. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @	$15.50
Local Coke Foundry, No. 1	11.25 @	11.50
Local Coke Foundry, No. 2	10.50 @	11.00
Local Coke Foundry, No. 3	10.00 @	10.50
Local Scotch	11.50 @	11.75
Ohio Strong Softeners No. 1	13.00 @	14.00
Southern Silvery, No. 1	..... @	11.50
Southern Silvery, No. 2	..... @	11.00
Southern Coke, No. 2	10.00 @	10.35
Southern Coke, No. 3	9.75 @	10.00
Southern, No. 1, Soft	10.25 @	10.50
Southern, No. 2, Soft	9.75 @	10.00
Tennessee Charcoal, No. 1	15.00 @	15.50
Tennessee Charcoal, No. 2	14.50 @	15.00
Alabama Car Wheel	17.85 @	18.00
Jackson County Silvery	15.00 @	16.00
Other Ohio Silvery	13.00 @	13.50

The troubles in the Connellsville Coke region are the prevailing feature of the Pittsburgh market. Should the strike now under way be greatly prolonged it will necessitate the blowing out of a number of furnaces, and possibly cause an advance in the price of Iron. Foundry Iron is in light demand, No. 2 ruling at $10.50 @ $10 75, Pittsburgh. Quotations are as follows:

Neutral Gray Forge	$9.25 @	$9.50, cash.
All-Ore Mill	9.50 @	9.75 "
No. 1 Foundry	11 25 @	11.50 "
No. 2 Foundry	10.50 @	10.75 "
Bessemer	10.35 @	10.50 "

There has been some increase in the volume of business in Pig Iron during the week, which is seemingly the result of lower prices to consumers at Northern points, there having been a reduction in freight rates from Birmingham to the Ohio River of 50¢ ℔ ton and to some Northern and Eastern points of more than this. This has enabled the Southern furnaces to meet the competition of Northern furnaces on a more equitable footing. As a rule, prices of Pig Iron at the furnace have not changed. No. 2 Foundry is offered at $7 ℔ ton and No. 3 Foundry $6.50, f.o.b. Birmingham. A large part of the business during the week was for Iron delivered, and as it was not expected that the reduction in freight would be so large, rather better prices were obtained than could be now realized. There has been no movement in Charcoal Iron, and prices are nominal. Some sales of Coke Iron have been made for short forward delivery at the same prices as for spot delivery. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$10.50 @	$10.75
Southern Coke, No. 2	9.25 @	9.50
Southern Coke, No. 3	8.75 @	9.00
Ohio Soft Stone Coal, No. 1	14.50 @	15.50
Ohio Soft Stone Coal, No. 2	14.25 @	14.50
Lake Superior Coke, No. 1	13.00 @	13.50
Lake Superior Coke, No. 2	12.00 @	12.25
Hanging Rock Charcoal, No. 1	17.00 @	17.50
Hanging Rock Charcoal, No. 2	16.50 @	17.00
Tennessee Charcoal, No. 1	13.00 @	13.50
Tennessee Charcoal, No. 2	12.00 @	12 50
Standard Southern Car Wheel	16.25 @	17 00
Lake Superior Car Wheel and Malleable	16.50 @	17.0

Metal Market.

Pig Tin.—Prices have undergone an advance of about 30¢ ℔ 100 lb, and the market has been very firm, although devoid of anything in the nature of speculative support. It is estimated that the spot stock in first hands is not to exceed 1200 tons. The monthly consumption is estimated at 1200 tons. Of the 1200 tons spot stock about 980 tons are in bonded warehouse. It would therefore appear that only 320 tons of Tin imported prior to the levy of the duty of 4¢ ℔ lb remain unsold. Since the duty went into effect 3326 tons have been imported. The present bonded stock of dutiable Tin is about 980 tons. On the face of

the returns it would appear that duty has been paid on about 2346 tons since July 1, 1893, and it is not improbable, considering the course of local market prices in the interval, that a loss was made on the greater portion. The market seems now to be shaping for more satisfactory results, and the movement in that direction would probably be more rapid but for the uncertainties attending tariff legislation. At the close the market was strong, with Straits quoted at 19.50¢ net, cash, for 5-ton lots, early delivery. Forward deliveries are held at a premium of 5¢ @ 10¢ per month ; 19.60¢ was paid for 1 carload. Meanwhile the requirements of consumers have not induced any marked expansion in the demand, which continues moderate. Small lots of Straits Pig are quoted at 21¢ @ 21¼¢ ℔ lb.

Copper.—Little, if any, change has taken place in the market for ingot during the past week. Business shows no improvement, and sellers have been more actively interested than buyers. Still it does not appear that this slight sign of anxiety to sell has weakened prices, although imparting somewhat uncertain tone to the market. Current quotations are 9⅛¢ for Lake Superior Ingot, 9¼¢ @ 9⅜¢ for Electrolytic and 9¢ @ 9¼¢ for casting stock. Jobbing business is correspondingly slow, the demand for both Ingot and manufactured Copper being entirely disappointing. Retail prices for small lots are unchanged at former quotations.

Pig Lead.—The market has remained very quiet, and prices have averaged somewhat lower. Further than this there are really no facts to report, except that 3 40¢ is now a quite general selling price for common Western in carload lots. Regarding supplies little is said, but it is the general belief that an accumulation at primary points has taken place during the past two weeks. Jobbers and retailers complain of extreme dullness and indifference on the part of consumers. Prices are inclined to weakness.

Lead Sheet and Pipe.—There has been absolutely no improvement in the demand for these materials. Purchasing of plumbers' supplies is on the narrowest scale possible, consumers taking nothing beyond what is required to fill immediate needs. Business compares very unfavorably with former seasons.

Spelter.—Slow business and very indifferent demand have again been experienced, leaving the market in a flat, uninteresting condition. No pressure to sell has developed, however, and prices seem quite steady at 3.80¢ for ordinary Western brands, delivered here or at common points. One car, spot, was offered at 3.75¢ on the Metal Exchange. Statistically, however, the conditions for an advance in Spelter could hardly be better. There are at present 62 furnaces in operation west of the Mississippi River, in comparison with 122 furnaces at this time a year ago. In addition to this, over 95% of the galvanizing works in the country are in operation. Stocks everywhere are light; consequently an upward turn in prices seems to be only a question of time.

Antimony.—The demand is still of ordinary type and the market bsre of new feature. Prices stand at about 8⅞¢ @ 9¢ for Hallett's and 10¢ @ 10½¢ for Cookson's. with the usual premium of about ¼¢ on small lots from store.

Nickel.—No change is reported, 40¢ being quoted as the going price.

Tin Plates.—At intervals there has been a fair trade in spot Plates and some manifestations of interest in futures; but, on the whole, the volume of business has been light in comparison with the general run at this season of the year and decidedly disappointing. Prices show no radical change, being at about the bottom level in all lines of Plates. The demand for Bessemer Cokes for the use of Southern canners, which should be exceedingly active at this time of the year, is particularly slack. This is partially accounted for by the damage done to the fruit crops and injury to growing vegetables by the recent severe weather. But tariff uncertainties have also contributed materially to restrict purchases. Canners generally are hanging on until the last moment before placing orders for what they will need this season, and they have about another month's leeway before they absolutely need to purchase. Meanwhile, stocks of imported Cokes are unprecedentedly short and but little stock is on its way to this country. Consequently, any large expansion of the demand would be difficult to meet. It is said, moreover, that the stock of Bessemer Cokes on the other side is by no means large. Roofing Plates are in fair average routine demand, which is easily met by the domestic manufacturers.

A special cable dispatch to *The Iron Age* from London, dated April 4, reports a fair business in 14 x 20 Cokes. Good orders had also been received for Black Plates. Liverpool quotations for Plates were as follows:

IC Charcoal, Alloway grade	12/ @ 12/3
IC Bessemer Steel, Coke finish	10/6 @ ....
IC Siemens " " "	11/ @ ....
IC Coke, B. V. grade, 14 x 20	Nominal.
Charcoal Terne, Dean grade	10/3 @ 10/6

V. Clad & Sons, Philadelphia, Pa., issue for the season of 1894 an illustrated price-list of ice cream machinery. The pamphlet opens with a brief description, illustrations and price-lists of a variety of different styles of ice cream machines for hand and power, this section including freezer with steam engine attachments. The next goods noticed are ice breakers and freezers. Then come a variety of supplies. It is impossible to enumerate all the goods referred to in this pamphlet, but suffice it to say that it contains a most complete list of articles of this sort.

Chicago Report.

Scrap.—Very little is being done in anything but Cast Scrap. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite. — Prices have been reduced 85¢ ℔ ton on the old schedule. Carload lots of 12 net tons or over are now quoted as follows:

	Grate.	Egg, Sto. and Ch
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6 75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6 55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.	
Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.55

The estate of S. Whitnum (E. H. Little, manager), North Eleventh street and Driggs avenue, Brooklyn, N. Y., report that the past year has been the most prosperous one they have had. The firm, who are manufacturers and galvanizers of Leader Pipe, Kitchen Boilers, Sinks and Boiler Stands, have just put in a 40-ton cupola, and have increased their galvanizing department by an additional pot, making six in all. Their plant is very complete, being some 200 feet square, and having a capacity for galvanizing articles 20 feet in length.

John H. Blood, representing John McVoy & Co. and the Midland Steel Company of Muncie, Ind., with warehouse in Chicago, has opened an office in room 1141 Monadnock Building, Chicago, for the sale of Galvanized and Corrugated Sheet Iron and Sheet Steel.

M. L. Hull of Cleveland, Ohio, directs attention in his advertisement this week to various specialties, some of the claims for which are set forth in connection therewith. The assortment includes burners of various kinds, together with Plumbers' and Tinners' Furnaces.

CONDITION OF THE

Hardware Trade.

OUR ADVICES from the trade at large indicate on the whole a continued improvement in business, and in some of the trade centers there is a very fair volume of trade. In others the reports are not quite so satisfactory, but on the whole it is evident that there is a better demand for goods, which, it is expected, will continue with some increase as the season advances. The trade are still buying very carefully and limiting their purchases to their immediate requirements. They are influenced to continue this policy by the lack of strength in the market and the lower prices which have been developed in many lines. Collections afford little ground for complaint, and the financial condition appears to be on the whole satisfactory.

Advices from Chicago.—Orders for Shelf Hardware are now increasing in amount, showing a gradual improvement in the business of the country at large. The demand held up remarkably well last week in view of the severe storms and very cold weather which prevailed throughout the entire Northwest. The proportion of straight Hardware continues to grow larger, and jobbers look forward to a good trade during April from the way in which the month has opened up. The demand for staple goods is inclined to be quiet except Barb Wire, which is moving in a very satisfactory manner. The Heavy Hardware trade kept up last week to the average for the month, and March closed with a record fully equal to expectations. The trade for April has thus far shown a slight falling off as compared with the opening of March. Collections are steadily improving.

Notes on Prices.

Wire Nails.—The Wire Nail market is in a peculiar condition, inasmuch as notwithstanding the fact that the volume of business is good and most of the mills are well occupied on orders, prices are lower and the tone of the market not strong. The price is represented by the quotation of 95 cents to $1 for carload lots at mill. The fact that such prices are named is evidence of the active competition which exists among the manufacturers and their desire to keep their mills in operation. Some orders are being received from the large trade, and a good many smaller houses are taking advantage of the low prices prevailing and find that in many instances on fair lots they can purchase more advantageously from the manufacturers than through jobbing houses. Small lots from store in New York are held at $1.20 to $1.30.

Advices from Chicago.—Not much new business is reported by manufacturers' agents. Buyers are inclined to hold off and await developments, being very well stocked for the present. Quotations from factory are a shade under $1.10, Chicago, but the general price asked seems to be $1 at factory. Freight rates vary according to the location of the establishment. Small lots from stock are now selling at $1.15 to $1.20.

Cut Nails.—The price of Cut Nails in the Eastern market is somewhat unsettled, as the desire to keep their mills in operation has had the effect of inducing lower quotations by the manufacturers than prevailed a month or two ago, and at the same time they are feeling the effect of Western competition to a certain extent. Western Nails are being offered delivered in New York and other Eastern points at 95 cents to $1 base, and it is intimated that these figures have been shaded in some cases. Small lots from store in New York are held at $1.10 to $1.15, slight concessions being made on larger lots.

Advices from Chicago.—A report was circulated widely last week that the Lake Side Nail Works had shut down for lack of orders. This report was false. The works are in full operation with no immediate prospect of closing. Manufacturers report a very fair volume of business for the week. The market, however, was disturbed by the appearance of Ohio River manufacturers, who made very low quotations in the hope of securing a share of the Chicago business. Regular rates are still $1 on 55 cent average. Small lots are quoted at $1.10 from stock.

Barb Wire.—There is little change in the condition of the Barb Wire market, the demand continuing excellent and prices being on the whole well maintained. The regular quotations of the manufacturers are as follows on Four Point Galvanized: Pittsburgh, $2.15; Cleveland, $2.20; Cincinnati or Allentown, $2.25; Chicago or New York, $2.35.

Advices from Chicago.—Nothing new has occurred in this line. Manufacturers appear to be in excellent shape, with sufficient business on hand and daily being received to hold prices up to the figures recently quoted and maintained. Carload lots of Galvanized are selling at $2.25 to $2.30, and small lots from stock are quoted at $2.35 to $2.40.

Cordage.—The Cordage market is in an unsettled condition, and lower prices have been developed. Last week a leading outside concern made a quotation of 6 cents base on Manila Rope, which had the effect of bringing down the prices of other manufacturers, some of whom are selling at this price, while others refuse to name lower than 6¼ cents. The latter figure is regarded as representing the market at this time, though it is intimated that slight concessions may be obtained. Sisal is being sold at 4¼ cents base, and there is little difficulty in obtaining the goods at this price. New Zealand is also quoted at 4¼ cents base. Rumors are current in regard to impending changes in the management of the United States Cordage Company, and it is understood that negotiations are still pending with a view to the identification of the Good interests with those of the company. What the outcome may be is uncertain, but it would not be surprising if there were some developments of interest within a short time.

Stove Bolts.—The base discount on Flat and Round Head Stove Bolts has been made 65 per cent. instead of 60 per cent. as heretofore.

Bay State Rivets.—In their discount sheet, April 2, American Screw Company, Providence, R. I., quote Bay State Rivets ¼ cent net per pound less than Norway Rivets, instead of by list and discount as heretofore.

Sheet Zinc.—Under date March 27, Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue revised discounts on Sheet Zinc. The price remains $4.50 per 100 pounds in 600-pound casks, of the thicknesses between Nos. 9 to 15, inclusive, and of the widths between 32 to 46 inches, and of the lengths between 84 to 90 inches. The extras are also unchanged. The revised discounts are as follows:

Discounts.	First class. 15 600-pound casks and upward.	Second class. 10 to 14 600-pound casks.	Third class. 5 to 9 600-pound casks.	Fourth class. Under 5 600-pound casks.
	Per cent.	Per cent.	Per cent.	Per cent.
Special	9	9	9	9
Cash with order	3	3	3	3
Quantity	3	2	1	0
Totals	15	14	13	12

All discounts are computed straight when money accompanies the order. Quantity discount is added to special discount in all cases. If remittance is received within 10 days of date of invoice the cash discount will be only 2 per cent. instead of 3 per cent., and not computed straight. Each order is strictly subject to the quotation of the class to which it belongs.

Furnace Fittings.—Under date of April 1, 1894, the Carton Furnace Company, Utica, N. Y., and Chicago, Ill., issue a special net trade price-list of Furnace Fittings. These Tin Plate Fittings, they announce, are made of best quality of IX prime, full weight, charcoal bright Tin Plate, and the Gal-

vanized Iron Fittings are made of best Bloom Galvanized Iron. All are hand made. We reprint below the prices on Round Hot Air Pipe, Register Boxes and Elbows:

Round Hot Air Pipe.

Inch.	Per foot.
7	$0.10
8	.11
9	.14
10	.16
12	.18
14	.28
16	.30
18	.35

Register Boxes. (Floor.)

	Each.
8 x 10	$0.27
8 x 12	.28
9 x 12	.30
9 x 14	.32
10 x 12	.33
10 x 14	.35
12 x 15	.45
14 x 18	.60
16 x 20	.70
18 x 24	.90

Elbows. (Hot Air.)

Four Piece.

7	$0 25
8	.27
9	.30
10	.32
12	.42
14	.54
16	.77
18	.95

Prices are also given on Square Pipe, hot air; Square Pipe Elbows, regular; Square Pipe Elbows, flat; Square Pipe Tees, regular and flat; Square Pipe Offsets, regular and flat; Boots, regular pattern, flat back; Boots, center pattern, round; Boots, offset; Floor Register Heads; Side Wall Register Heads, square and circular top; Double Side Wall Register Boxes, square and circular top; Furnace Collars for flat and pitch casing tops; Hot Air Pipe Dampers and Clips, Safety Thimbles, Galvanized Iron Smoke Pipe, Galvanized Iron Smoke Pipe Elbows; Check Damper Tee Pieces, Galvanized Iron; Common Smoke Pipe Dampers and Check Dampers, Cast Iron.

These Fittings are also furnished, covered with the best quality of asbestos paper, for 20 per cent. additional to the net prices. Terms are net cash, 30 days from date of invoice. No discount is allowed at settlement.

Yates' Astringent Lacquer.—Yates & Co., Rockford, Ill., are furnishing Yates' Astringent Lacquer to dealers for making paste stove polish in large or small quantities and at a very low price; also avoiding the trouble with the variation that may occur in the quality of paste polish after it has been in a can any length of time. The point is made that a dealer can thus mix, without heat, any grade of paste polish in a short time, saving the cost of manufacturing, canning and packing. It is pointed out that the lacquer can be used for making liquid stove polish, rust proof varnish, rust proof paint for roofs, soldering flux, &c. The lacquer is put up in from 2 to 10 gallon cans, and sold at the following net prices:

	Per gallon.
2 and 3 gallon cans	$1.25
5 and 10 gallon cans	1.00

Glass.—If there is any change in the condition of the Glass market, it is encouraging for manufacturers rather than otherwise. Local jobbers report a fair business for the month of March and a tendency toward firmer prices. There is a feeling among representative manufacturers and jobbers that the prices which have ruled for the past month or more should not continue indefinitely. This is indicated by a rather informal meeting of Glass men held at Pittsburgh a week or two since, at which the situation was reviewed; also by a meeting recently held at Marion, Ind., by Glass manufacturers. While the objects of the meetings were not divulged, it is understood that the discussion related to existing prices. It is also understood that the Western manufacturers met entirely independent of those of Pittsburgh or other Glass districts.

Old Metals.—There is rather more business doing in Old Metals, but it is on a strictly conservative basis. Prices continue low. In the case of some grades of Scrap Iron, however, it is said that dealers have been able to get a little more money. Inquiries are somewhat more numerous. The following quotations represent dealers' purchasing prices in New York:

Heavy Copper	℔ lb	7¢
Light and Tinned Copper	℔ lb	6¢
Heavy Brass	℔ lb	5¢
Light Brass	℔ lb	4¢
Lead	℔ lb	3¢
Tea Lead	℔ lb	2½¢
Zinc	℔ lb	2¼¢
No. 1 Pewter	℔ lb	13¢
No. 2 Pewter	℔ lb	6¢
Wrought Scrap Iron	℔ gross ton	$7.50 @ $8.50
Heavy Cast Scrap	℔ gross ton	7.00 @ 8.00
Stove Plate Scrap	℔ gross ton	4.00 @ 5.00
Burnt Iron,	℔ gross ton	3.50 @ 4.00

Old Rags, Paper, &c.—Prices for these materials show but little improvement, and the demand does not broaden to any extent. Quotations are nominally as follows:

No. 1 White Rags	℔ lb	3¼ @ 3½¢
No. 2 White Rags	℔ lb	2¼ @ 2½¢
Mixed Rags	℔ lb	3¼¢
Blues and 3ds	℔ lb	1 @ 1¼¢
Hard Sized White Shavings	℔ lb	2¼ @ 2½¢
No.1 White Book Shavings	℔ lb	2 @ 2⅛¢
No.2 White Book Shavings	℔ lb	1 @ 1⅛¢
Light Book Shavings	℔ lb	¾¢
No. 1 Mixed Shavings	℔ lb	¾ @ 1¢
No. 2 Mixed Shavings	℔ lb	½ @ ¾¢
No. 1 Printed Books	℔ lb	1 @ 1¼¢
Ordinary Mixed Books	℔ lb	½ @ ¾¢
Newspapers	℔ lb	2-5 @ ½¢
No. 1 Manila Paper	℔ lb	1 @ 1⅛¢
No. 2 Manila Paper	℔ lb	⅝ @ ¾¢
Bogus Paper	℔ lb	⅝¢
Common Paper	℔ lb	½¢
Straw Chips	℔ lb	½¢
Binders' Clippings	℔ lb	½ @ ⅝¢
Jute Butts	℔ lb	1⅞ @ 2¢
No. 1 Jute Bagging	℔ lb	1 @ 1¼¢
Mixed Bagging	℔ lb	¾ @ 1¢
No. 2 Bagging	℔ lb	½ @ ¾¢
Hemp Twine	℔ lb	2 @ 2¼¢
Manila Rope	℔ lb	2¼ @ 2⅝¢
Jute Rope	℔ lb	1½ @ 1¾¢
Mixed Rope	℔ lb	¾ @ ⅞¢

Old Rubber.—The market for Old Rubber shows some improvement, but prices are somewhat irregular. The following quotations represent approximately those given by dealers in this city:

Car Springs, ton lots	℔ lb	@ $0.03½
Rubber Shoes, carloads, delivered at factory	℔ lb	@ .03½
Rubber shoes, less than carloads	℔ lb	@ .03¾
Large Hose,	℔ ton	@ 12.00
White Wringer Rolls	℔ lb	@ .03¾
White Syringes,	℔ lb	@ .03¾

Trade Notes.

The Union Soapstone Works, 14 Marshall street, Boston, Mass., issue circulars illustrating and giving prices of their various Soapstone articles. The cuts show Laundry Tubs, Sinks, Drainboard Sinks, Foot Warmers, Griddles, &c. Full lists of sizes and prices accompany the illustrations.

Among the manufacturers who have given special attention to perfecting the quality of Galvanized Sheet Steel Ware are the Geuder & Paeschke Mfg. Company, Milwaukee, Wis., whose trade in this line has extended all over the United States. The goods are made of Sheet Steel of the best quality, and after the articles are completed they are immersed in a bath of molten slab zinc, which effectually closes all seams and makes the ware proof against rust and leakage.

The Star Milk Cooler Company, Haddonfield, N. J., have shipped to Stephen Francisco, Caldwell, N. J., the largest Milk Cooler that they have ever built. The apparatus is 11 feet high, 6 feet 6 inches wide and weighs 1000 pounds. It has a capacity to reduce the temperature of 20 quarts of milk per minute from 98° to within 2° of the spring water used as the refrigerant, which is forced through the machine by a steam pump. This Cooler was selected by a number of the leading physicians of Newark, East Orange and Orange, to co-operate with the Board of Health of Newark to improve the condition of the city's milk supply.

Kieckhefer Bros.' tinware factory in Milwaukee, Wis., was slightly damaged by fire on the night of the 28th ult. While the loss was trifling and the fire caused no interruption to business, it was attended with a most lamentable accident. When it had been extinguished, the body of the night watchman was found in the japanning room. The supposition is that he was knocked senseless by an explosion, and was then suffocated before the firemen discovered him.

Donlon & Miller Mfg. Company of Brooklyn, N. Y., were incorporated at Albany last week, to deal in gas and electric fixtures. The directors are John Donlon, Arthur S. Miller, John F. Miller of Brooklyn, and others. Capital, $50,000.

The city of Niles, Ohio, has voted $10,000 for the purchase of a site and for a bonus to the new Sykes sheet mill to be built there at a cost of $100,000, and to employ 75 men. They will manufacture sheets for roofing purposes.

Repairs on the sheet mill engine being completed, the mills of the Reeves Iron Company, Canal Dover, Ohio, have resumed operations.

It is announced that the sheet mills of the Newport Rolling Mill Company, Newport, Ky., will resume operations this week after a shut down of several weeks. The heavy assorted stocks usually carried by this company have been depleted and a steady run is expected.

Reports are current to the effect that Raymond G. Sykes of Niles, Ohio, and

James Ward of Newcastle, Pa., are interested in the project to start the sheet rolling mills at Joliet, Ill.

WHILE MANY BELIEVE that an early return to the normal conditions of business is improbable, yet there are concerns who find much encouragement in the outlook for the near future. The E. W. Bliss Company of Brooklyn are erecting in their works two of the largest and heaviest presses which they make—viz., their Nos. 14 and 15 Toggle Drawing Presses. The former weighs about 140,000 pounds, and is driven by an engine attached to it. It is about 14½ feet in hight and has a width between the uprights of 54 inches and will draw articles up to 11 inches in depth. It can be started or stopped at any point in the stroke by means of a friction clutch. These Presses are used in drawing up such articles as kitchen boiler heads, cylinders, steel sinks, heavy black iron and enameled ware. The press is to be shipped in about a week to England to be used in drawing up heavy steel shells. The No. 14 Press is somewhat lighter, weighing about 75,000 pounds, having a distance between the uprights of 30 inches, and will draw articles in depth up to 10½ and 12½ inches. This Press, while it will draw articles of greater depth, has not the requirements for doing nearly as heavy work as the No. 15 Press. This Press is being built for one of the large tinware stamping concerns in this country for drawing up heavy enameled iron ware of various descriptions.

E. T. BARNUM, Detroit, Mich., has furnished for the Alpena National Bank, Alpena, Mich., the grill work for their newly arranged offices. It consists of flat twisted metal in square mesh, riveted at each intersection with scroll border, having scroll pickets on top. All the work is electro plated in antique copper finish.

BRUCE SMITH & CLARENCE BREWSTER, Middletown, Conn., have begun the manufacture of their recently invented Water Filter. The Filter is reversible and embodies some new features.

THE PITTSBURGH REDUCTION COMPANY of Pittsburgh, manufacturers of pure Aluminum, have fitted up a large room in the Ferguson Block in that city, in which is shown a large number of articles made of Aluminum. Cooking and other culinary utensils, toilet articles and fine art castings form a part of the interesting display.

KRAUSHAAR LAMP & REFLECTOR COMPANY, St. Louis, Mo., have removed to 2510 and 2512 North Eighth street. The specialties which they manufacture consist of Car Trimmings, Headlights, Lamps, Street Railway Brass Work, &c.

WE RECEIVE from Josiah M. Read, 63 Blackstone street, Boston, Mass., circulars of the different styles of sliding dampers manufactured by him for controlling the draft of air in pipes. Their use in connection with stoves and furnaces is commended by a number of testimonials.

A substantial find of gold is reported from Virginia, a town in the Mesaba range, St. Louis County, Minn. The discovery is said to have been made accidentally while explorations for iron ore were being conducted on property owned by P. J. McCann. West Superior capitalists have become interested in the matter.

SCRAP.

THE PHILLIPS TIN PLATE COMPANY, Philadelphia, are putting in a new tinning machine of the Phillips type specially for best and ordinary coke finish plates. This will make an equipment of five sets, three of which will be employed on ternes, one on best charcoal tins and one on best and common coke finish tin plates. The firm are also adding to their plant a new and economical automatic pickling machine built by Newbold & Son of Norristown, Pa.

NORTON BROTHERS, manufacturers of tin and sheet metal goods, whose Chicago factory was recently burned, have decided to concentrate their manufacturing operations at Maywood, Ill. They require much greater facilities than they now have at that place, and propose to add considerably to the plant. The new building will probably cost $200,000 and will be located on the south side of the Northwestern Railroad and extend from Sixth to Eighth or Ninth avenue. Plans for the new structure have been completed by Frederick R. Schock, and bids for its construction are being received. The building will be constructed in the shape of a hollow square covering an area of 243 x 243 feet, two stories high. It will extend to a depth of 72 feet to an inner court, and in center of this a boiler house, 30 x 40 feet, will be constructed. In this court will be a one-story section on both sides of the boiler house for the use of employees. On the side of the main structure there will be an annex 21 x 155 feet. The interior of the building will be of mill construction throughout and will be provided with elevators. The exterior will be constructed of pressed brick, relieved by stone trimmings, and will be ornamented by two towers.

THE ELLWOOD TIN PLATE COMPANY, Ellwood City, Pa., have been granted a charter, with a capital stock of $10,000. The directors are A. W. Brown, Cambridge, Ohio, H. W. Bishop, Cleveland, Ohio, and R. C. Aiken, North Sewickley, Pa.

THE CHICAGO TIN PLATE MFG. COMPANY, whose works are located at Fortieth street and Wentworth avenue, Chicago, have opened a city office at Room 583, The Rookery. All purchases of material and sales of product will in future be made from the city office. The company have made steady progress since their establishment in June of last year. They report their tin and terne plate as giving so much satisfaction that they cannot meet the demand and are therefore arranging to at once put in additional cleaning and tinning machines.

N. E. WHITAKER of the Whitaker Iron Company, Wheeling, W. Va., in association with some friends, is contemplating the erection of a tin plate manufacturing plant. The matter will, however, depend largely on the outcome of the tariff bill now before Congress. Washington, Pa., is mentioned as the probable location of the works.

A PARAGRAPH has been going the rounds of the daily press which states that a number of New York capitalists have organized a syndicate and completed plans for the erection of one of the largest tin plate plants in the country. The syndicate is said to have a capital of $300,000 to spend on the establishment of the plant, which, says the report, is to employ, when completed, 800 men. The citizens of Washington, Pa., are said to be anxious for the location of the new works in that town, and to have expressed their readiness to take shares in the concern. Inquiries made in New York elicit the fact that there is a foundation of truth in the above report, although some of the details given are premature. A number of persons of prominence in the iron and metal trades are forming plans for the establishment of a large tin plate works, but the carrying out of the project will largely depend on the course of tariff legislation. The place of location is not, however, yet decided on, nor have any definite plans been yet completed.

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Metal and Miscellaneous Prices.

CHICAGO, APRIL 5, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Oalland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 3.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.35
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

Steel Coke—IC, 10x14,14x20. $5.65 @$5.75
IC, 14x20.90 ℔ ..... @ 5.25
IC, 14x20, 100℔ .. 5.50 @ 5.65
10 x 20 ..... @ 8.50
20 x 28 ... 11.30 @11.50
IX, 10x14, 14 x20 ..... @ 7.25
B.V. Grade. IC,10x14, 14x20. 5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—
IC. 14 x 20 ...@ $5.62½
20 x 28 .....@ 11.25
IX. 20 x 28 .....@ 14.25

Worcester Brand and equal.—
IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.00

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20. $9.25
Royal, extra. IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$8.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch, IC, 20 x 28.....@$11.25
Crescent, IC, 20 x 28.....@ 11.75
Crescent, IX, 20 x 28.....@ 14.75
Empire, IC, 20 x 28.....@12.00
Empire, IX, 20 x 28.....@15.00
Hickory, IC, 20 x 28.....@ 12.50
" IX, 20 x 28.....@ 15.50
Alaska (heavily coated), IC, 20x28 @$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 15.00
" IX, 20 x 28.....@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28.....@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28.....@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28..... @$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28.....$23.60
Westmoreland:
IC, 14 x 20..... $5.87½
IC, 20 x 28..... 11.75
Elwood:
IC, 20 x 28..... $11 75
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50
Illinois, Old Method:
IC, 20 x 28.....$17.00
E. L.:
IC, 20 x 28.....$12.50
Jessie:
IC, 20 x 28.....$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20..... $9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20..... 11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28..... 19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28..... 22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28.....12.50
" " IX, 20 x 28.....15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared).....$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)..... 19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)..... 16.50
Columbia, IC, 14 x 20 (Stamped).... 7.25
" IC, 20 x 28 (Stamped)....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped)..... 13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28..... 13.00
Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28..... 12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 ..... 12.00
Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
" (Redipped), IC, 20 x 28.....17.00
Old Process:
IC, 14 x 20..... 9.25
IX, 14 x 20..... 11.25
IC, 20 x 28..... 18.50
IX, 20 x 28..... 22.50
H. B. L., Old Style:
IC, 14 x 20..... 7.75
IX, 14 x 20..... 9 25
IC, 20 x 28..... 15.50
IX, 20 x 28..... 18.50

Sheet Iron—

Black.

Nos.	Common American	Refined.
10 to 16	℔ 2 4-10¢	3 ¢
17 to 20	℔ 2 5 10¢	3 1-10¢
21 to 24	℔ 2 6-10¢	3 2-10¢
25 and 26	℔ 2 7-10¢	3 3-10¢
27	℔ 2 8-10¢	3 4-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality..... dis. 75%

Copper—

Ingot.

Lake.....11¢ @ 11½¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list, 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...35¢
Plain, above 3 inch.....45¢
Plain, 5-16 inch.....45¢
Plain, ¼ inch.....60¢
Plain, 3-16 inch.....$1.00
Plain, ⅛ inch.....$1.50
Fancy Tubing, Brass, to No. 20 incl.....43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass.....
} 40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....4¾¢
300 ℔ casks.....5 ¢
Loose sheets.....5¼¢

Lead—

Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12½¢@12¾¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12½¢
Hallett's.....11¼¢@11⅝¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain.....60&10%
1¼ and under, Galv.....52½&10%
1½ and over, Plain.....70&10%
1½ and over, Galv.....60&10%
Boiler Tubes, list Oct. 24, 1892.....70&10%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.50 square
Climax.....$3.35 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.50 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ ℔, 2 ¢
" " Brown.....℔ ℔, 1¼¢
" " Purple.....℔ ℔, 2¼¢
" Ground in oil, B. Red ℔ ℔, 6¾¢
" Ground in oil, Red..℔ ℔, 6¼¢
" Ground in oil, Brown ℔ ℔, 5¾¢
" Ground in oil, Purple ℔ ℔, 6 ¢
Linseed Oil, Boiled, in bbls.....54¢
Linseed Oil, Raw, in bbls.....51¢
Mineral Paints.....2@4¢
Orange Mineral.....9¼¢
Pure White Lead in Oil.....6@6½¢
Dry White Lead in bbls.....5½@5¾¢
Red Lead, American.....6@6½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¼¢; kegs.....7¾¢
Sipe's Japan Oil, in bbls, ℔ gal..... 84¢
Spirits Turpentine, in bbls., ℔ gal...36¼¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.75
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, APRIL 6, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:
Small lots.....℔ ℔, 75¢
100-℔ lots.....℔ ℔, 73¢
Ton lots.....℔ ℔, 70¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....℔ ℔, 70¢
100-℔ lots.....℔ ℔, 65¢
Ton lots.....℔ ℔, 60¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....℔ ℔, 05¢
100-℔ lots.....℔ ℔, 60¢
Ton lots.....℔ ℔, 55¢

Antimony—

Cookson.....℔ ℔, 10¾¢
Hallett's.....℔ ℔, 10 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.	
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35	25@30%
Plain, to No. 20, above 3 inch	45	
Plain, 5-16 inch to No. 20	45	
Plain, ¼ inch	60	
Plain, 3-16 inch	1.00	
Plain, ⅛ inch	1.50	
Fancy Tubing to No. 20, inclu	43	

Copper and Bronze Tubing—

8¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ ℔
Over 3½ to 5 inches inclusive.....18 ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....13¢ ℔ ℔
Over 3½ to 5 inches inclusive.....19¢ ℔ ℔

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

*Bottoms, Pits and Flats..*12¢ ℔ ℔, net
Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10 ¢
Ausonia Grade Casting.....9¼¢
Planished......net
Sheet and Bolt.....15¢ ℔ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2.60	2.90¢
Nos. 17 to 21	℔ ℔, 2.70	3.00¢
Nos. 22 to 24	℔ ℔, 2.80	3.10¢
Nos. 25 and 26	℔ ℔, 2.90	3.20¢
No. 27	℔ ℔, 3.00	3.30¢
No. 28	℔ ℔, 3.05	3.40¢

American B. B.....℔ ℔, 4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11¾@12½¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 8¢
Craig Polished Sheet Steel.....℔ ℔ 3¾¢

Galvanized.

	B. B.	
Nos. 10 to 16		75@76&5%
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Filter Joints—

Lee's.....33⅓%

Lead—

American Pig.....3¾¢@4¢
Bar.....4¼¢
Pipe.....5¾¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6¾¢, 20%
Old Lead in exchange, 2¾¢ ℔ ℔.

Metal Exoanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1¾ @ 2¼

Linseed Oil:
Raw, ₱ gal..... @ .40
Boiled..... @ .43
Spirits Turpentine:
In bbls..... @ .32
utty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01¼ @ .02½
In bladders..... .01⅛ @ .02¼
Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₱ ton..... $30.00@$35.00
Asphaltum, Rock, ₱ ton..... $14.00
Coal Tar Felt, 1 Ply, ₱ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₱ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₱ roll 108 sq. ft. $1.85
Roofing Pitch, ₱ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, Inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₱ bbl. $1.10@$1.20
Rosin, E. & F..... ₱ bbl. $1.30@$1.45
Rosin, G. & H..... ₱ bbl. $1.65@$1.90
Rosin, I. & K..... ₱ bbl. $2.25@$2.60
Rosin, M. & N..... ₱ bbl $2.90@$3.00

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₱ sqr..... $3.25@$4.50
Pen Argyle, ₱ sqr..... 3.50@ 4.25
Peach Bottom, ₱ sqr..... 5.00@ 6.25
No. 1 Chapman, ₱ sqr..... 4.00@ 4.65
Lehigh Slates, ₱ sqr .... 3.00@ 4.50
Vermont:
Sea Green, ₱ sqr..... 2.70@ 3.20
Purple, ₱ sqr..... 3.50@ 4.50
Unfading Green, ₱ sqr..... 3.50@ 4.00
Red, ₱ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₱ ℔..... 4¢
Smaller quantities, ₱ ℔..... 5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
8 bls., about 500 ℔, ₱ ℔..... 3½¢
½ bbls., about 300 ℔, ₱ ℔..... 4¢
Kegs, about 110 ℔, ₱ ℔..... 4¢
Kegs, about 55 ℔, ₱ ℔..... 4¢ } 75¢ extra for keg.
Yager's Soldering Salts.
¼ ℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢@4½¢
Bertha (pure)..... 8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ℔..... 21¾¢
Straits, pigs, ₱ ℔..... 21¢ @ 21½¢
Straits in bars, ₱ ℔..... 22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20 ..$7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20 ..... 5.50
" IX, 14 x 20..... 6.50
Atlantic, IC, 14 x 20 ..... 5.75
Bonus, Extra Coated, IC, 14 x 20 .. 6.75
" " IX, 14 x 20 ... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28 ..... 11.50
Central, IC, 14 x 20..... 5.87½
Climax, IC, 14 x 20..... 5.50
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20 ..... 6.00
Dane, IC, 14 x 20 ..... 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 ....12.00
" " IX, 20 x 28 .... 15.00
Empire, IC, 14 x 20 ..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20 ..... 5.25
Fort Pitt, IC, 20 x 28 ..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20.. 6.25
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20 ..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20 ..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20 ..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20 ..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Newcastle Real Old Method, IC, 14x20 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20 ..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20 ..... 5.25
Palacio, IC, 14 x 20..... 5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 8.00
Phœnix, IC, 14 x 20..... 5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20..... 5.75
Tip Top, IC (Resquared), 14 x 20..... 6.62
" IX " 14 x 20..... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20 ..... 5.37½
Vigilant, IC, 14 x 20 ..... 5.50
Waldo Redipped, IC, 14 x 20..... 6.75
Westmoreland, IC, 14 x 20 ..... 6.25
Wilkinsburg Redipped, IC, 20 x 28. 16.00
" IX, 20 x 28. 19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.50
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Iowa, IC, 14 x 20 ..... 5.75
" IX, 14 x 20 ..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merlon, IC, 14x20..... 6.75
Mint, IC, 14x20 ..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20 ..... 7.25
Versailles, IC, 14 x 20 ..... 5.75
Youghiogheny, IC, 14 x 20..... 6.00

Imported Terne Plates—
Charcoal.

MF Grade, IC, 14 x 20..... $7.50
20 x 28..... 15.00
IX, 14 x 20 ..... 8.75
20 x 28 ..... 17.50
Pontymister Grade, IC, 14 x 20..... 6.50
20 x 28..... 13.00
IX, 14 x 20..... 7.50
20 x 28..... 15.00
Worcester Grade, IC, 14 x 20..... 5.75
20 x 28..... 11.50
IX, 14 x 20..... 6.75
20 x 28..... 13.50
Dean Grade.—IC, 14 x 20..... $5.37½
20 x 28..... 10.70
IX, 14 x 20..... 6.40
20 x 28..... 12.80
Abercarne Grade.—IC, 14 x 20..... 5.25
20 x 28..... 10.50
IX, 14 x 20..... 6.40
20 x 28..... 12.80

Imported Bright Plates—
Charcoal.
Duty: 2.2¢ ₱ ℔.

Melyn and Caliland Grade.	IC, 10 x 14	$6.37½
" "	IC, 12 x 12	6.62½
" "	IC, 14 x 20	6.37½
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.87½
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
" "	DC, 12½ x 17	6.50
" "	DX, 12½ x 17	6.50

Coke.

Steel Coke.—IC, 10x14, 14x20 $5.25@$5.35
10x20..... 8.12½
20x28..... 11.00
IX, 10x14, 14x20..... 6.60
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plates

IXX, 14x28..(112 sheets)..... $13.35
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x81..(112 sheets)..... 16.00

Tinning—Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz.... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₱ doz..... 18.00

Zinc—

600 ℔ casks..... ₱ ℔ 4¾¢
Per ℔ ..... 5¼¢ @ 6½¢

It Is Reported—

Delaware.

That J. H. Cleaver, late of the firm of Cleaver & Hearn, Stove dealers, Wilmington, has opened a store with a full line of Stoves and Tinware at 6 East Fourth street.

Illinois.

That J. B. Watson's Hardware store at Barry was destroyed in a large fire at that place March 30.

That Boutwell & Schad have recently opened a new Hardware store at Lake Villa.

That Patterson & Moss, late of Danville, have leased two large rooms in the Haworth Block, Decatur, where they will establish a wholesale Hardware house, carrying a stock valued at $25,000.

Indiana.

That the H. Lundt Hardware & Roofing Company have recently commenced business at Hammond.

Indian Territory.

That the Turner Hardware Company, Muscogee, have commenced the erection of a large new building, which they will occupy on completion.

Iowa.

That Smith Bros.' Hardware store, at Sheldon, was damaged by fire on the 21st ult.

That E. S. Carson has entered the Hardware business at Lacona, having purchased one of the Hardware stocks at that place.

That C. E. Foster, lately of Stanbury, Mo., has located at Cincinnati, where he will engage in the Hardware and Implement business.

That Bailey & Ford is the style of a Hardware firm recently formed at Duncombe.

That L. Parrish recently disposed of his interest in the Hardware business, at Glenwood, to his partner, Frank Gigray, and is now traveling for a dry goods house.

That the Implement store of Carter & Shakers, El Dora, was destroyed by fire on the 19th ult.

Louisiana.

That the capital stock of the C. A. Brusle Hardware Company, Plaquemine, has been increased from $10,000 to $25,000.

Maine.

That Alger Munsey has opened a Stove and tinsmith store at Wiscasset.

Michigan.

That Adam Wagner has opened a new Hardware store at his old stand at Utica.

That Jilbert & Lang will soon open a new Hardware store at Houghton.

That Mr. Gray of Leonidas has purchased G. Baldwin's Hardware stock and is now conducting the business.

That Frank E. Hixson of West Bay City has purchased the interest of Asa Newman in the Hardware firm of Newman & Kennedy, Portland, and the style of the firm has become Kennedy & Hixson.

That A. D. Banker, Grand Blanc, has sold a one-half interest in his Hardware and Implement business to Charles M. Stuart, The business will hereafter be conducted under the style of A. D. Banker & Co.

Minnesota.

That Andrew Byram of Redwood Falls will soon enter the Hardware business at Austin.

That Henry Nelson has purchased the Hardware stock of P. Lier, Ashby.

That A. E. Johnson has bought the Hardware store of A. B. Hansen & Co., on Second street, Hastings, and will hereafter conduct the business under his own name.

That thieves entered the Hardware store of Otto Kaupp & Son, Blue Earth City, on the 18th ult., and breaking open the safe abstracted $15 in cash and a gold watch. A drawer in the safe containing $90 was overlooked.

That the large fire at Cokato on the 20th ult. destroyed the Hardware store of P. O. Hamburg; loss, $6000; insurance, $3000.

That Schneider Bros. have opened a new Hardware store at Adams.

That Horn Bros. of Delavan have sold their Hardware store to Shoen & Herring.

That Newton & Parks have disposed of their Hardware stock at Tracy to D. H. Evans.

That H. O. Monson & Co., Hardware merchants of Wheaton, have gone out of business.

That B. F. Turnbull will soon open a Hardware store at Rainy Lake City.

That Bronson & Son of Luverne have disposed of their Hardware and Farm Machinery business to Elmer Huntington.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, April 14, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Tin Plate Production.

Col. Ira Ayer's special report of the production of tin and terne plates in the United States for the quarter ended December 31, 1893, an abstract of which is printed in another column, presents several features of interest in connection with this industry. Although the aggregate output of plates —27,357,241 pounds—was but little over 200,000 pounds in excess of that of the previous quarter, it should be borne in mind that the last quarter of the year was one of unusual depression, bordering on panic to all the industries of the country. In this depression the sheet metal trade took its full share; and that the tin plate manufacturing industry not only held its own during that disastrous quarter, but even exceeded the output of the previous three-monthly period, is cause for congratulation. It is an indication of underlying strength which is quite significant. Had the then condition of things been normal, there is no reason to doubt that the tin plate industry would have shown a remarkable step in advance in the last quarter of 1893. On this account the report must be taken as a satisfactory one.

American Black Plates.

But a further source of satisfaction is shown in the increasing ratio of American black sheets, lighter than 63 pounds per 100 square feet, produced and used for tinning. The rapid development of the production of these sheets is clearly shown in the tables presented. The total output of black plates for tinning purposes, according to the sworn statements of 17 firms, was 19,679,910 pounds, as compared with 11,355,368 pounds in the former quarter. Of this total 90 per cent. belonged to the lighter class, as against a proportion of 72 per cent. in the September period. Then again, out of 39 manufacturing concerns the proportion of firms using entirely the American product has increased to 21, while 12 more use domestic plates in part. The aggregate output of tin and terne plates made from American black sheets, and, therefore, being American plates in the strictest sense of the term, increased in the December quarter to 15,907,669 pounds, against 11,443,572 pounds made from foreign black plate, or about 58.16 per cent. of the whole. These figures are, as we have said, interesting, as showing that even the fear of tariff changes and the universal trade depression of the latter part of last year, were not operative in depressing this industry to any appreciable extent.

Machinery in Sheet Metal Working.

Probably no field of mechanical industry has been more completely transformed in its methods and in its commercial importance by the increasing use of machinery than sheet metal working. In coppersmithing, it is true, old time methods still prevail to a considerable extent, but in the working of sheet iron, tin plate, sheet brass, &c., in which individual parts are joined by seaming, riveting, soldering or brazing, the largest proportion of all the operations is performed by machinery. Even the soldering of a large number of articles now made of tin plate is done by machines. No doubt the reasons why the coppersmith's art has not shared to an equal extent the revolution thus effected in other branches of sheet metal working are partly the fact that the principal industrial uses to which copper lends itself in the unalloyed state do not necessitate the extensive employment of numerous small pieces to be shaped and subsequently joined together, and partly the nature of the metal itself, which distinguishes it from other metals, rendering processes by which they are worked inapplicable to it in greater or less measure.

Cleveland, Ohio, Manual Training School.

The new building which is to accommodate the Central Manual Training School, in Cleveland, Ohio, was recently thrown open for use. Its interior arrangements and general design are after plans prepared by the principal, William C. Skinner, to whose unwearied efforts a large share of the credit for its erection is due. The building is of white sandstone, handsome in appearance and surmounted by a high tower. It is divided into three general subdivisions on the two main floors and in the basement, and a large number of windows afford perfect illumination to the various classrooms. Among the departments on the main entrance floor is that of wood working, which includes a pattern shop containing 25 lathes of latest design. This shop will accommodate 25 boys at one time, and four classes will be taught in a day. The machine shop, equipped with engine lathes, planers, shapers, drillers, milling machines, &c., is on the same floor. The second floor contains the carpenters' shop and drawing room, each of which will hold a class of 25 boys at a time. The smiths' shop occupies one-half of the basement, with a score of modern forges. The other half is given up to the power, heating, lighting and ventilating apparatus. The heating and ventilation are well provided for. A large fan run by a small auxiliary engine draws in the air from outside and through a screen which separates from it the particles of dust. The air is then passed through a system of steam pipes, which heat it to the desired temperature before it is sent through the building.

Evening Educational Classes for Mechanics.

The Young Men's Institute of New York, Y. M. C. A., located at 222 and 224 Bowery, New York, is an institution doing splendid educational work in the line of instruction and assistance, in both general and technical knowledge, to the young mechanics of the city, by means of evening classes. These classes are growing in importance every year. They have been found to fill, in a very satisfactory degree, the educational requirements of a large number of young men employed in various trades, who are anxious to widen their knowledge or supply the deficiencies in their early mental or mechanical training. During the season of 1893-4, just brought to a close, 635 young men have availed themselves of the advantages offered by the institute for a very small fee. These youths have had the choice of 11 different courses of study, which include such valuable practical subjects as freehand, mechanical and architectural drawing, carriage drafting, penmanship, bookkeeping, shorthand and typewriting, arithmetic, steam engineering and electricity, and it is a gratifying circumstance that so many young mechanics have embraced the opportunity. The mental and moral value of such work as is being carried on by the Young Men's Institute is obvious.

The next meeting of the Western Foundrymen's Association will take place on Wednesday, April 18, at 7.30 p.m., in rooms 702-703 Temple Court Building, 225 Dearborn street, Chicago. A paper by Thos. D. West will be read.

THE LETTER BOX.

No Place for Boiler.

From F. H. A., *Lancaster, Pa.*—Will *The Metal Worker* please inform me if I can get a satisfactory circulation with a boiler setting in a basement and connected with a range on the floor above, which would make the top of the boiler below the bottom of the range? I have tried every way to find space for the boiler without putting it in the basement, but it is impossible.

Answer.—There would be danger with the arrangement described, for under heavy firing steam would be sure to form in the water back and probably in sufficient quantity to drive all of the water out of a hot water back, and when, through condensation, water could again enter an explosion through quick generation of steam would be a natural result. The boiler may be auspended horizontally from the ceiling in the room where the range is, with the side opening at the bottom to carry the cold water to the water back and the return to connect with the opening in the bottom of the boiler. The supply may be attached to the opening having the tube as usual, and the hot water outlet should have a pipe to run into the boiler and up near the top, ao as to secure the hottest water. A boiler is frequently set in an upper room.

Sheathing for Tin Roofing.

From B. J. P., *New York.*—I intend putting tin on a steep roof, using the standing seams, and a question ariaes with me whether the tin will rust quicker on the under side if the sheathing is laid about 2 inches apart than it would if matched sheathing is used laid tight. I would like to hear from the roofers on this subject.

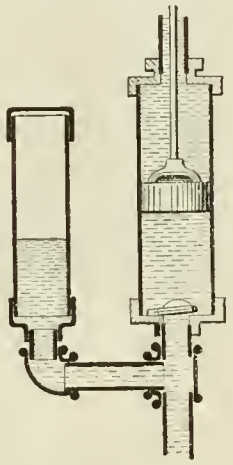
Buoyancy of Air Chambers.

From B. S., *Connecticut.*—I am making air chambers to put in a sail boat which are 10 inches in diameter and 26 inches long, made of galvanized iron of No. 28 gauge. Please inform me what is the buoyancy of these cans—that is, how much will each one hold up in the water?

Answer.—A calculation shows the weight of the cans to be about 5 pounds apiece, or, allowing for the seaming of the metal and the solder, &c., perhaps a little over 5 pounds. The capacity of a can 10 inches in diameter and 26 inches long is 2042 cubic inches. Reducing this to cubic feet and multiplying by 64.08, which is the weight in pounds of a cubic foot of water, we find the weight of a volume of water of the capacity of a can to be 75.7 pounds. Allowing 5.7 pounds for the weight of the can itself gives a buoyancy of 70 pounds each. We have taken no account of the weight of the air, as it would be a very small matter to allow for.

Vacuum Chamber for Drive Well.

From C. S. S., *Litchfield, Minn.*—I send a sketch of a vacuum chamber which I have used with good results in several cases where pumps in drive wells failed to operate properly. Of course the chamber will not make a pump give water where there is none, but it will greatly increase the capacity of any single action pump that is connected with a drive well where there is a supply of water. The chamber will also greatly relieve the pump from the jerk or kick caused by the water not



Vacuum Chamber for Drive Well.

coming up the pipe as fast as the plunger rises in the cylinder. The partial vacuum in the chamber above the water line causes the water to rush through the supply pipe during the upward stroke of the pump handle or downward movement of the plunger. When the handle is forced down and the plunger raised, water is drawn from the chamber as well as from the supply pipe. I have applied this device to pumps in drive wells that worked very hard and gave a limited supply of water. In every instance it overcame the difficulty, and in some cases caused the pump to work as easily as if connected with an open well. I hope this device will be of service to the readers of *The Metal Worker*, and that some of them will give it a trial and report the result.

Strips or Sheet at a Time?

From C. A. W., *Chicago, Ohio.*—I would like to be informed through *The Metal Worker* which makes the best flat seam roof when 20 x 28 tin is used—that laid sheet at a time, or that put on in strips when the strips are from 18 to 26 feet long? What is a "kicker," of which "J. F. S." speaks in *The Metal Worker* of March 31?

Note.—We hope our readers will answer this correspondent on the roofing question. The "kicker" is the name generally applied to roofing seamers made by different manufacturers, and probably comes from the use of the foot in operating them. They are used, in standing seam roof, to turn the higher edge over the lower one, which is done by the hands, while the turn down is closed tight by stamping the foot on a lever.

Lukewarm Water.

From C. D. F., *Berwick, Pa.*—I am called in to arrange a plumbing system, that was erected by another person, so that hot water can be got from it at all times. I inclose herewith a sketch of it. An ordinary range is connected with a 50-gallon boiler, and after it had run for a few days only lukewarm water ran from the faucets. The boiler was connected with the water back with 1-inch pipes. I took these out and put in ¾-inch pipes, and for about eight or ten days a good supply of hot water was secured, when the old trouble was renewed and only lukewarm water could be drawn. I shall be glad to receive any suggestions as to what would overcome this difficulty, for it is the first time I have been stuck in 35 years of practice. There is a good supply or force of water at the top story even when five or six hot water faucets are opened.

Note.—Our correspondent's sketch has not been reproduced, as the method of connecting the boiler showed nothing unusual, and the pipe if run as shown had no defect. We will be glad to have our readers make suggestions as to the cause of the lukewarm water after a supply of hot water has been secured from the system. We think that the changing of the pipe from 1-inch to ¾-inch was a move in the wrong direction, although this would not create the trouble reported. It is possible that the water deposits lime in the pipes and partially closes them, or it might be that the longer the fire is run the more ashes accumulate against the water back and reduce the heating capacity.

Cold Water Comes First.

From W. L. H., *Sudbury, Ont.*—I inclose you a sketch of a job of plumbing which I have done in our town which does not work satisfactorily. The difficulty is hot water cannot be gotten before about a pailful of water is drawn from any of the taps. Three-quarter-inch pipe is used throughout, with the exception of the boiler connections, where 1-inch pipes are used for connecting a 40-gallon boiler with the water back. The hot water pipe is brought up above the supply tank and a check valve put on the end to prevent air entering from the tank and to permit the escape of any air or steam that may arise in the boiler.

Answer.—We have not reproduced our correspondent's sketch, which shows

fixtures on the same floor with the boiler and on two floors above it. It is natural that the water in the pipe between the boiler and the fixtures will become cool if none is drawn off and that when the faucet is opened the cold water in the pipe would have to escape before the hot water comes. This can be overcome by connecting a smaller pipe with the hot water pipe at the highest point and returning it to the boiler and connecting it with the pipe from the boiler to the water back. This will keep up a continual circulation and enable hot water to flow from the faucets as soon as they are opened.

Wants Furnace Suggestions.

From CÆSAR, *Louisville, Ky.*—In the diagram and request from "A Tinner, Montana," in *The Metal Worker* March 24, for suggestions regarding the heating of a church, I notice one omission on his part that is very essential for a person to know before he can intelligently make suggestions: it is the size of the furnace. This church should have a furnace with a 30 to 32 inch fire pot at the least. In regard to the outlet for smoke, "A Tinner" has a very serious difficulty to overcome at the outset in a 10-inch collar and smoke pipe and an 8-inch flue. The smoke pipe has an area of 78 square inches, and the flue has only 64 square inches, making a difference of at least 25 per cent. against him. This, however, can be overcome by constructing a flue box having a 10-inch collar on one end and two 8-inch collars on outlet end. This box should be not less than 18 inches wide and 12 inches deep and 12 to 14 inches long, that is, from collar on furnace to end where both 8 inch pipes connect. Then divide the box by a partition placed perpendicularly so as to throw the two 8-inch collars separate from each other. This partition must continue the full length of box until the end of partition will divide the 10-inch collar on furnace into two equal parts, as shown by sketch. By this construction a workman is enabled to attach from two to four smoke pipes to one flue or *vice versa*. In regard to the registers, it is noticed that the hot air outlet is cramped, being only 685 square inches in area, and the exhaust, as near as can be judged by the size of registers, one 20-inch and two 12 inch, equal 540 square inches in area, making a difference of 145 square inches. In the style of heating adopted in this case the exhaust should equal hot air inlet in area. If I might offer the suggestion I would plant this job as follows: One 48-inch round register over furnace with an area of 900 square inches. I would connect pit under furnace with 18 x 18 registers placed in four corners of church by four 17-inch pipes having a combined area of 907 square inches. This will give a complete circulation in the church. I notice that all of the exhaust is placed in south end of the church, while the north end, which is the coldest end of building, is left to contend against the natural pressure from the north and west, but also against the unequal circulation inside. I hope that these suggestions will be received in the same spirit in which they are offered.

Wants Furnace Suggestions.

Loss of Steam Pressure.

From J. G., *Philadelphia.*—I think, from reading *The Metal Worker*, April 7, that "H. B. C.," St. Louis, probably has gauge pipe on kettles obstructed. I would suggest that he transpose kettle gauge to steam pipe and steam pipe gauge to kettles and note the result. While kettle gauge is off blow steam through opening where it was. Look into gauge and see that it is not obstructed. When sure that gauges are both right—if result is as now—then he has a leaking pipe underground, or steam traps leak through. If the kettles are very large and the contents cold, probably the ¾-inch supply pipes are too small to maintain pressure above 20 pounds. Possibly the valves have the pressure on top of the disk instead of under it, and the disk drifts upon the valve opening, being loose, and partially closes the same. I have known a loose disk to entirely close a line of steam pipe, and while the valve handle turned the disk did not respond, consequently when the valve was thought to be open it was really closed.

From R. D., *New York.*—In reply to "H. B C.," in *The Metal Worker* of April 7, would suggest that he disconnect the kettle and see if the annular opening between the two shells has not been contracted more than was intended, or the steam pipe may go through so far as to come in contact with the inner shell, thereby contracting the opening. It may be that the valve on the trap has been removed and allows the steam to blow through. The gauges may not be placed in a favorable position. I would take out all the ¾-inch pipe, also the gauge pipe, and ream them out, as the cutters leave large burrs projecting on the inside, which is very serious where the pipe is small.

From REX, *Rochester, N. Y.*—If "H. B C.," St. Louis, will turn steam on to his kettles when empty, he will find that the pressure on the kettle gauge will stand very near the same as the gauge on the line; by filling the kettles with water he will see how quick the pressure will drop, showing that the steam connections to the kettles are too small.

Fuel for Furnaces.

In a letter from a correspondent in Rochester, N. Y., entitled "Fuel for Furnaces" and published in *The Metal Worker* of April 7, page 36, appeared some misprints which need correction. In the first column, on the twenty-fourth line from the top "250 bushels" should read "520 bushels," and similarly in the thirty-second line. On the fifty-ninth line the price of coal should read $5.25, and in the fourteenth and fifteenth lines from the bottom of that column the phrase "three times longer" should read "three days longer."

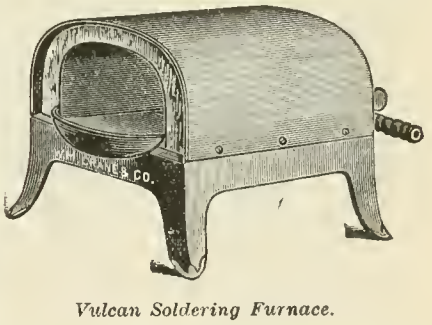
A. B. Sproul, New Haven, Conn., tin and sheet iron worker, has been obliged by increase in business to add to his premises and has taken in 240 Wooster street in addition to 242 Wooster street, where he has been located.

Chicago Builders and Walking Delegates.

The builders and contractors of Chicago have planned a grand *coup* for the discomfiture of the walking delegates who have been giving them so much trouble this spring. It is the cessation of all building operations throughout the city on the 12th inst., to continue until an agreement can be made by the employers and their workmen which will enable work to be prosecuted without the vexatious interference of the walking delegates, who are constantly fomenting trouble in order to magnify their own importance. There is no question of wages involved in this movement, although in some lines there are such disputes pending. These troubles, however, are to be settled by those interests which are directly concerned. The builders, contractors and materialmen have formed an organization styled the Central Building League to carry out their purposes. The action was taken at this time to forestall strikes threatened in several trades which promised to seriously interfere with building operations now becoming unusually heavy. It is deplorable that action of this kind should seem necessary just as workmen are finding employment in large numbers after a most trying winter of scanty work and great privations. The conflict, however, has been brought about by the workmen themselves. It is hoped that a speedy settlement may be made, so that the interruption to work will not be serious. If it should be prolonged it will be a severe shock to business, as so many interests are affected apart from those directly engaged in the unfortunate controversy.

Vulcan Soldering Furnace.

W. M Crane & Co., 838 Broadway, New York, are marketing the Vulcan soldering furnace, as here illustrated.



Vulcan Soldering Furnace.

It is intended for heating soldering coppers by gas. The burners are located on each side of an opening 7 inches long and 2 inches wide in the floor of the oven, and so arranged that melted solder cannot get into it and clog them. Parallel with the floor of the furnace are a set of cast iron supports on each side, on which a pair of coppers can be placed, keeping them warm when not in actual use. When needed, the copper rests directly over the opening, so that the flame passes over and around the whole copper. The furnaces are made in two sizes, Nos. 1 and 2. No. 1 is 8½ inches long, 5 inches wide and 7 inches high, No. 2 being the same length and hight, but 2 inches wider. These are brick lined, to economize fuel. Nos. 3 and 4 are similar, but not lined. The consumption of gas is put at 12 cubic feet an hour, but can be graduated at the cock if less be required.

Press Working of Sheet Metals.—IV.

BY OBERLIN SMITH.

Cutting Processes.

Having more or less accurately formulated the ideas of writer and reader regarding tools and materials, we will now deal with actual processes, showing in such diagrams as may be necessary only conventional forms for shear blades, dies, &c., and omitting as far as possible, for the sake of simplicity, pictures of the presses themselves or of the methods of fastening dies thereto. The details treated of will generally require only certain views of the working surfaces of the respective dies and of the materials worked therein. The letters U and L will represent upper and lower dies respectively in their conventional sense, although it must be remembered that the respective positions of these are, in practice, sometimes reversed, or in some cases turned at right angles or at some other angle to their usual vertical position—as in horizontal shearing machines, inclined presses, &c. The metal or other material when shown between the dies will usually be represented by dotted lines and will be marked M.

Chiseling.

If we analyze cutting processes as performed in presses we find a most primitive idea to be that of the chisel, as shown in Fig. 84. This is in a certain sense a form of coining or forcing the tool bodily into the metal. Practically it is an application of the wedge, which was probably carried out in antediluvian times, when the primeval metalworker found a particularly sharp edged stone and pressed it hard down upon his piece of copper or lead that he might separate it and make the one twain. In modern practice this principle is carried out in the blacksmith's chisel, in the tinman's punch, in various sharp edged dies for cutting shoe soles or other articles of leather, paper, &c., and in that form of foot or power press known as a "sprue cutter," which is usually made with two chisels meeting each other, as in Fig. 85, or more often with one sided chisels, as in Fig. 86, these leaving less of a lump upon the casting *s* when the sprue *c* is removed.

In all chiseling processes there is, of course, a tendency to raise a burr upon each side of the knife, as shown by the dotted lines in M.

Shearing.

The next and most usual process for cutting materials embodies the principle of shearing, shown in its most primitive form in Fig. 87, where a certain part of the material is pushed away from a plane represented by one of its surfaces, as *a a*, Fig. 87, into another plane parallel thereto, by being slid past the other part of the material, which remains in its normal position. This sliding of certain particles or molecules of metal past certain other ones constitutes the stress known in engineering by the general term of "shear," and is governed by well-known laws as to the resistance of the material itself. These laws it is not necessary now to define or formulate further than the reference which will be found near the end of this chapter to the pressures required for such shearing.

In Fig. 88 is shown, in end view, a more usual form of shear blades, the cutting edges being made at an angle of about 75° between their two limiting surfaces, instead of 90° as in Fig. 87. In Fig. 89 is shown the same blades as they often appear after practical use, with their edges rounded off and their adjustment altered so that their vertical faces do not touch one another. In Fig. 90 is shown the appearance of a bar of metal as sheared apart at *s* with the dull blades just mentioned. In the left hand piece the lower corner is rounded, while the upper corner runs up into a sharp burr that has crept up between the blades. Just to the left is an indentation caused by the compressive action of the blade itself. The other piece of metal is, of course, the same but reversed in position.

In Fig. 91 is shown in vertical cross section a piece of sheared sheet metal with the same rounded corner and the same burr at the top, but with a cleaner cut, as made by sharper and well set blades. The burr and round corner are exaggerated, but they are usually present in some degree in all kinds of shearing and punching work. They must be allowed for even in working thin metals with sharp dies, as it is often a matter of consequence on which side of the work this slight burr shall appear and which side shall have a slightly rounded corner.

In Fig. 92 is shown a face view of the blades in Fig. 88, the same being made parallel, so that all points along their cutting edges will come into contact with the metal at the same time. This form is best where the metal must not be twisted or otherwise disturbed, and is good enough in any case where it is quite narrow in comparison with its thickness, as with square bars. With such proportions it obviously is not practicable to much lessen the pressure required to do the cutting by dividing it up and extending it over a longer time. Such an extension of time and lessening of the pressure at any particular moment may sometimes be obtained, however, by making one of the blades, like the upper blade in Fig. 93, with an inclination of the edge, commonly known as "shear." This evidently is useful only where the width of metal cut is considerable. It is obvious that in such case one edge of the piece of bar or sheet metal is pushed down by the upper blade and depressed in advance of the other edge, thus producing a bending action across the sheet which distorts it more or less from its original flat condition as at M. This action is seen in the curling up and twisting of a narrow strip cut from a piece of paper with a pair of scissors, or a sheet of tin plate with a pair of snip shears. In many cases it does no harm, and we therefore see the great majority of shearing machinery made in this way. This inclination of one blade to the other is usually somewhere between 2° and 10°. If the angle is too great the tendency of the work is, obviously, to slide lengthwise of the blades, or toward the left in Fig. 93. The greater the angle the easier the work is done by the machine and the more the sheet is distorted, and *vice versa*.

It is very desirable that the word "shear," as designating the angle of inclination referred to and also the act of mechanically producing such inclination, should be changed for a less confusing term, as this word is already used in many cases for the press itself which does the shearing and for each of the blades which are mounted thereupon, and for the act of doing the cutting work itself. Thus in this connection we may easily have such an awkward and misleading sentence as the following:

"Tom, shear half an inch the upper shear in the two-ton shear, that it may shear more easily by having more shear—and, I say, Tom, leave a sheer opening of an inch and a half."

The above sentence reads like sheer nonsense. It is, of course, given as an extreme case of the evil referred to, but I have heard orders uttered which were nearly as confusing. The word in question is above used the first time as a verb, denoting the act of grinding more inclination upon one of the blades; the second time as a noun, meaning the blade itself; the third time as a noun, meaning the machine in which the blades are mounted; the fourth time as a verb, denoting the act by the machine of shearing the material worked upon; the fifth time as a noun, designating a detail of construction of the blades, and the sixth time (differently spelled) as an adjective, defining the space between said blades. In my own practice I am endeavoring to use the term "dip" as a substitute for "shear" in this connection, but I probably may not succeed in inducing the public to accept it. This word is given by Webster as a synonym for slope and pitch and has in its favor brevity and crispness, together with no danger of confusion with other terms apt to be used in the same connection. It also is correct from an engineering point of view (at any rate in the case of ordinary upright shearing presses) as representing some angle of inclination with the horizon, and it is already applied to such angles in mining parlance when speaking of mineral veins. It would also seem somewhat appropriate in speaking of gangs and punches as shown in Fig. 97, which are set with their lower ends in a series of different hights, that they may not enter the work all at once and thus bring the pressure required for each cumulatively upon the press. In this case certain of the punches have a dip, so to speak, below the other ones, in the sense of reaching downward. A word often used in connection with such punches is lead, meaning that one has the lead of some other one in first striking the work. To tools of this kind the word "shear" is hardly applicable at all, but the word "dip," if it could be generally introduced, would answer for all cases of punches as well as shear blades.

Punching.

In Fig. 94 is shown in vertical axial section (which, by the way, is the kind of view given in most of the previous pictures where circular work has been represented, and which will be usually understood hereafter unless otherwise specified) a pair of ordinary round cutting dies, without dip, both working surfaces lying in planes parallel to each other. It is evident that such a pair of dies are in principle simply a pair of shear blades, like Fig. 92, bent around into a circle, and that the same principles involved in ordinary shearing hold good. This statement may be somewhat modified where the diameter of the blank (this term "blank" meaning in general any shaped flat piece cut from a sheet) is quite small in comparison with its thickness, as for instance in

[*Correction.*—In the article on "Press Working of Sheet Metals" in *The Metal Worker* of March 17, page 45, Figs. 76 and 77 were transposed, the latter being intended to represent the end of a flat bar of metal and the former a sheet of tin plate. Upon page 47, in the thirty-first line from the top of the first column, Fig. 82 should read Fig. 81.]

punching boiler plate, &c. In such cases a little more force must be required to do the shearing, on account of the blank being tightly confined in the hole from which it is pushed; while in doing the same amount of shearing in a straight line the piece cut off usually falls freely away without friction.

In Fig. 95 is shown an upper die or punch, such as is often used for boiler work, &c., with its lower end made in a spiral form, instead of lying in a plane normal to its axis. Various experiments with such punches have shown them to require considerably less force to drive them through than in the case of the ordinary flat bottomed ones.

about the vertical axis of the ram. Of course this cannot always be done, and in such cases a more rigid press will be required than in the other case. The lower die L in Fig. 96 is also shown dipped, having in this case four high points. In practice, however, one die is usually made flat, all of the dip being put upon the other. Which die should be flat depends upon the nature of the work. With a thin material, such as tin plate, and with diameters, say, not over 2 inches, this point is of little consequence, as both the blank and the sheet outside of it, if sprung out of flat while the die is going through, will readily be restored to a flat condition

In general, it is better theoretically to have only two high points upon cutting dies, either round or otherwise, as the metal which is sprung out of flat by reason of the dip is, in such case, simply bent into an approximately cylindrical shape, while with more than two points it is distorted in more than one direction into a dished shape or otherwise, which may permanently warp it beyond power of recovery, because certain parts of the metal are then actually stretched while others remain normal. This can be vividly demonstrated by merely bending a thick sheet of writing paper, which does not hurt it, and then by pushing it a little way into one's hat,

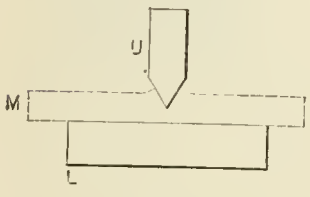


Fig. 84.

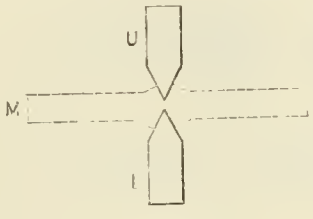


Fig. 85.

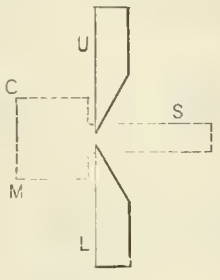


Fig. 86.

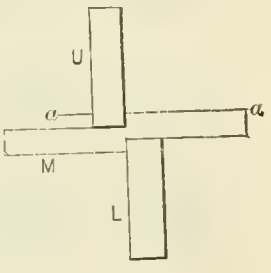


Fig. 87

Fig. 88

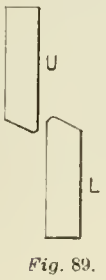


Fig. 89.

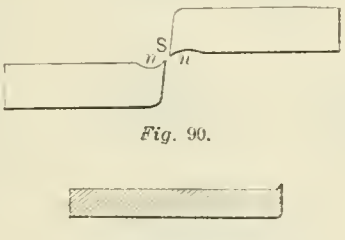


Fig. 90.

Fig. 91.

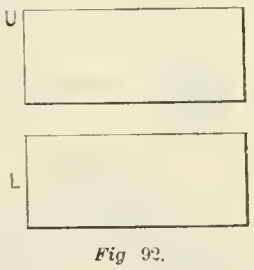


Fig 92.

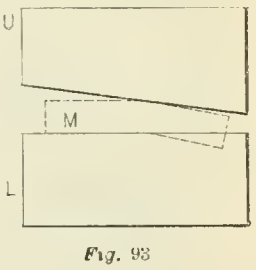


Fig. 93

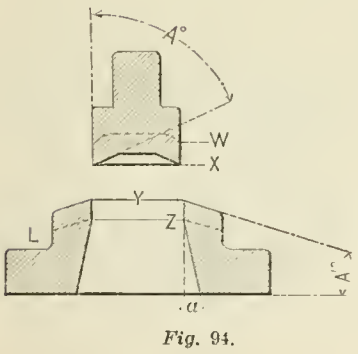


Fig. 94.

Fig. 95.

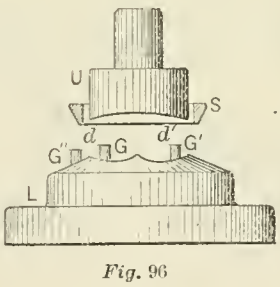


Fig. 96

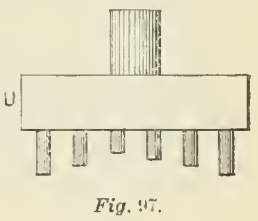


Fig. 97.

PRESS WORKING OF SHEET METALS.

In Fig. 96 the same principle of dip is shown in the upper die U with its two high points *d d'*. These strike the metal first, the bottom of this die being scooped out in general as if it had been held against a cylindrical grindstone. For large diameters this is much better than a single high point, as in Fig. 95, because the pressure upon the press ram is balanced, whereas with one point striking the metal first there is a tipping action which tends to spring the ram and upper part of the press frame out of a vertical position, and consequently to slide the upper die sidewise over the lower one. Such action often occurs in practice, to the considerable detriment of the cutting edges, and great care should always be taken, where a die is over 2 or 3 inches in diameter at any rate, to see that it strikes the metal at two or more points equally balanced

by their own elasticity. If, however, the metal is thick and rather non-elastic and the diameter small, it is evident that an upper die scooped out, as in Fig. 96, would bend the blank, perhaps beyond its elastic limit. In such cases, therefore, the upper die should be perfectly flat, that is, if no damage will be done to the sheet outside by its being bent as it rests on the dipped lower die. Usually in such cases this sheet outside is only scrap, and such bending will make no difference. If, however, it too must remain flat, the only recourse is to make both dies without dip and use more pressure to drive them. In cases where mere perforating is done—that is, where the sheet outside the blank is the article required for use and the blank is regarded as scrap—the upper die should always be the dipped one.

which ruins it. Practically, with thin metals this action may be neglected, and it is often best to put a high point at each angle of the contour line of blank, as *e. g.*, three in a triangular die, four in a square one, &c. These points entering the other die first serve to guide their relative motion during the rest of the stroke and thus to protect such parts of the cutting edges as follow after in their contact.

In Fig. 98 is shown a part of the frame of a press with a pair of plain shear blades mounted directly upon bed and ram. In Fig. 99 is a similar view, with shear blades made for cutting off round iron, there being a series of semicircular notches in each blade adapted to the sizes of iron to be worked. Upon this view there is also shown an adjustable gauge, G, such as is often used for pushing a bar against,

to regulate the length of the piece cut off. In Fig. 100 is a similar view of a deep throated press frame, with a small round punch and die mounted in chucks set therein, and supplied with an adjustable stripper, S. It may be here remarked that the word "punch" is very generally used to designate an upper die, whether cutting, forming, drawing or otherwise, but this practice is not universal. In many cases "upper die" is the better term—for one reason, because the word "punch" is also used as a verb to denote the operation and as a noun to designate the press itself, which is often called a "punch," especially if used for small holes in thick metals. The three views just given are copied from various machines commercially in the market, but are not given as of ideally the best design.

Blanks.

In Figs. 101 to 133, 135 to 150 and 155 to 160, all inclusive, are shown top views of various blanks, each of which has been cut from the sheet at one stroke of an ordinary pair of cutting dies. They are mostly of such shapes as are produced in ordinary tinware factories and consist chiefly of parts of pots, kettles and pans, &c. Figs. 151 to 154 have been merely sheared apart from a rectangular sheet by a gang of curved shear blades, thus producing at one blow the necessary pieces for a stove pipe elbow. Such work as Figs. 134 and 161 are perforated in gang dies, where a number of punches are set in an upper plate, as shown in Fig. 97, and where the lower die usually, but not always, consists of a single plate of steel containing proper holes for the punches to enter.

Gang Punching.

Fig. 162 illustrates a system of gang punching used for producing washers like Fig. 164 and other perforated articles. A pair of dies for such work are shown in Fig. 165, where the metal M, being fed in the direction of the arrow, is advanced to the point *a* at first stroke of the press so that the punch *u* will perforate it and drop through the punching or blank M′ (or Fig. 163). It is then advanced to the point *b* so that at the second stroke the punch *u′* will make the large hole around the small one. The pintle P, projecting below the same and set centrally therewith, enters the small hole and serves to guide the metal more accurately than would otherwise be done by ordinary gauging, so that a completed washer M″ (or Fig. 164) drops through the lower die L. At the same time the punch *u* is punching a second hole and dropping through another blank M′, which again is advanced at the next stroke to have another washer punched from around it, &c. Thus is produced a complete piece of work at each stroke, except the first and last at the respective ends of the bar or sheet. This method can of course be amplified so as to punch any number of holes, of any shape, and in any relative position, at the first stroke, and then, at subsequent strokes, to punch around each one separately or around or between any of them or any groups of them that may be desired. In this way are cheaply produced many small articles such as keys, parts of locks, &c.

Combination Cutting Dies.

Another general method of producing completed pieces at a single operation is by combination cutting dies, wherein one or more male dies are usually set inside of a female die, and *vice versa*. The sexual terms just used have not been before mentioned herein, but are generally understood as designating respectively any punch, such as U, Fig. 94—the male—which enters a die, and any die, such as L—the female—which is entered by a punch. This nomenclature applies not only to cutting dies, but also to those for forming, drawing, &c.

In Fig. 166 is shown a typical form of combination die of the kind referred to, which will produce any perforated work like Figs. 134, 161 or 164. As shown, it is arranged for cutting simply a circular ring or washer, M. Such ring, of course, remains upon top of the lower die L, the small blank cut from it dropping through as usual. An inspection of the picture will show that L consists of a male die at the outside and a female die in the center, while U consists of a female die outside and a male die in the center. The rings K K′ are used as knockouts or strippers and are usually driven by springs, the function of K being to drive the finished ring out of the upper die and of K′ to lift the surrounding remainder of the sheet from the lower die. The work is, of course, shoved out sidewise or backward, either by means of the sheet itself or by means of gravity, when the press happens to be in an inclined position. Such dies as these are largely used for cutting armature disks and such like accurate work, oftentimes being built with a large number of teeth or notches around the outer edge, which obviously makes them very expensive. They are, however, usually built up in sections, so that if one piece needs repairing or renewing the whole die need not be thrown away. Sometimes dies of the kind just described are turned upside down from the position shown. The objection to this, however, is that the blanks from the perforations have to be driven upward through a hole or tube which usually curves over and delivers them at one side of the upper die, or of the ram, should they be pushed so far up.

Recurring to ordinary gang punching dies for producing work, or rather scrap, of the general character shown in Figs. 161, 167 and 169, it is evident that in some cases the holes might be so near together that the little isthmuses, as we may call them, *i*, *i*, *i*, &c., would be too narrow (so as to avoid waste of metal) in the female die to secure the requisite strength for it to hold together. The remedy in such case is to so set the gang of punches and corresponding holes in the lower die that certain alternating holes may be punched in the metal, omitting the ones between, as for instance in Fig. 167, where those marked A are thus punched first. This diagram represents a sheet of tin plate from which six fruit can tops have been made in gang combination dies. The lower die is shown in top view in Fig. 168. After the first stroke the sheet is either turned around or turned over so that at the second stroke all those holes marked B will be punched, and so on. In feeding a long strip of metal by this system (see Fig. 169) there is no lost time except at the ends of the strip, where, for instance, in the case shown, only two holes, A A, could be punched at the first stroke, two whole ones and three halves, B B, &c., at the second stroke, but the five complete ones, C C, &c., as located in the lower die, Fig. 170, at the third and subsequent strokes.

A great deal of work is done upon this system in brass factories and other places producing small articles from long rolls of metal, the feeding usually being automatic. I am informed that this principle of interspacing dies has recently become the subject of a patent which, of course, is an absurdity, as the system is very old.

Cutting Dies.

In general, some of the important points desirable to secure in cutting dies are first rate material of proper hardness; great rigidity against distortion by springiness, especially in lateral directions, and durability by having ample length of bearing surfaces, as from *w* to *x* and *y* to *z*, in Fig. 94. Each die between these points should be perfectly parallel, so that when sharpened by grinding off the top surface of L and the bottom surface of U they will still fit each other as tightly as at first, or as nearly so as is consistent with what their cylindrical or prismatic surfaces, as the case may be, which slide against each other, have actually worn away. It is, therefore, very bad practice to make the hole in a round lower die conical all the way through and to make the upper die conical, decreasing from the bottom upward. Such dies will work well at first, but have very little life, whereas if made as in Fig. 94 they can be ground away gradually (upon their horizontal surfaces) to the points *w* and *z*. Below *z* it is necessary to have the size of the hole somewhat increased to give clearance to the blank, that it may not clog therein. Sometimes this is made conical, as shown, and sometimes it is enlarged bodily and left parallel, with a small step at *z*. It is well, however, to have this clearance quite small. On ordinary dies about 2 inches thick the writer has found it good practice to make the clearance distance *a* from $\frac{1}{32}$ to $\frac{1}{16}$ inch. In the upper die there is no need of giving any clearance, and some die makers even go so far as to make U slightly larger at the top, so that as the lower surface is ground off the bottom diameter is slightly increased, thus maintaining a tighter fit in the lower die than would otherwise be the case. It is generally easier, however, to make the sides parallel all the way up.

Hardness of Dies.

While in the case of punching and shearing thick metals the upper and lower dies or shear blades, as the case may be, are both made hard, there is a large variety of work where one of the dies is made moderately soft, the other one being as hard as possible consistently with not having the sharp edges crack off in working. Such dies can usually be worked upon all metals no harder than iron or very mild steel which are less than $\frac{1}{16}$ inch thick. The object is that the dies may be quickly and cheaply repaired, as far as maintaining sharp cutting edges is concerned, by hammering up the top or bottom surface, as the case may be, of the soft die, thus spreading out or riveting such die sidewise, making it larger if it be the male and smaller if it be the female. This can often be done without unsetting either of them from the press. After the proper amount of hammering the dies are oiled and forced together, the hard one shaving or broaching off the surplus metal from the soft one, thus leaving them again a good fit, one within the other. It is, of course, necessary that the hard die should in such case have a reasonably sharp edge. In most cases it is best to have it freshly ground.

The vexed question of which die shall be hard, male or female, is not of very much consequence, although many peo-

ple take it for granted that it should be the female, simply because they have always been accustomed to that method. One good reason exists for this, however, viz., the presence of a hard surface, which will not wear away so fast, over which to slide the sheets, these sometimes being covered with scale, and therefore doing a good deal of grinding on their own account. In some cases, however, where great accuracy of shape and size is required it is difficult to make the female die hard, because of the trouble of grinding it out to exact dimensions after hardening, ordinary grinding machinery not being made for sliding through small holes of irregular shapes. If, on the other hand, the male die is hard it usually can be ground exactly as wanted, because such grinding is on the outside where accessible. The reason for such after grinding being necessary is, of course, the warping or shrinking, or both, of the steel, which often happens after hardening to an extent great enough to spoil the accuracy with which the die was originally made. The difficulty of grinding above spoken of obviously does not occur with round and elliptical dies, as the female ones can be ground out inside in ordinary grinding lathes.

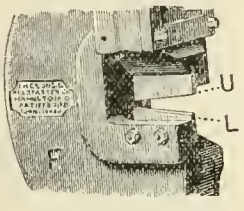


Fig. 98.

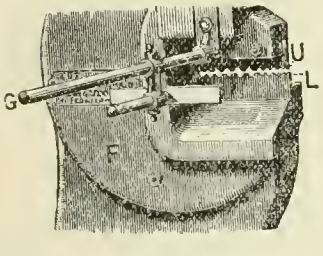


Fig. 99.

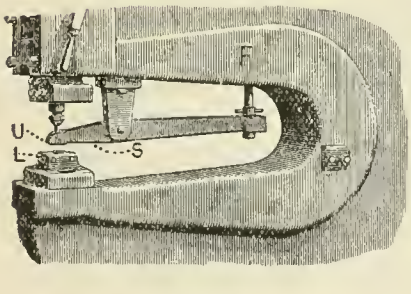
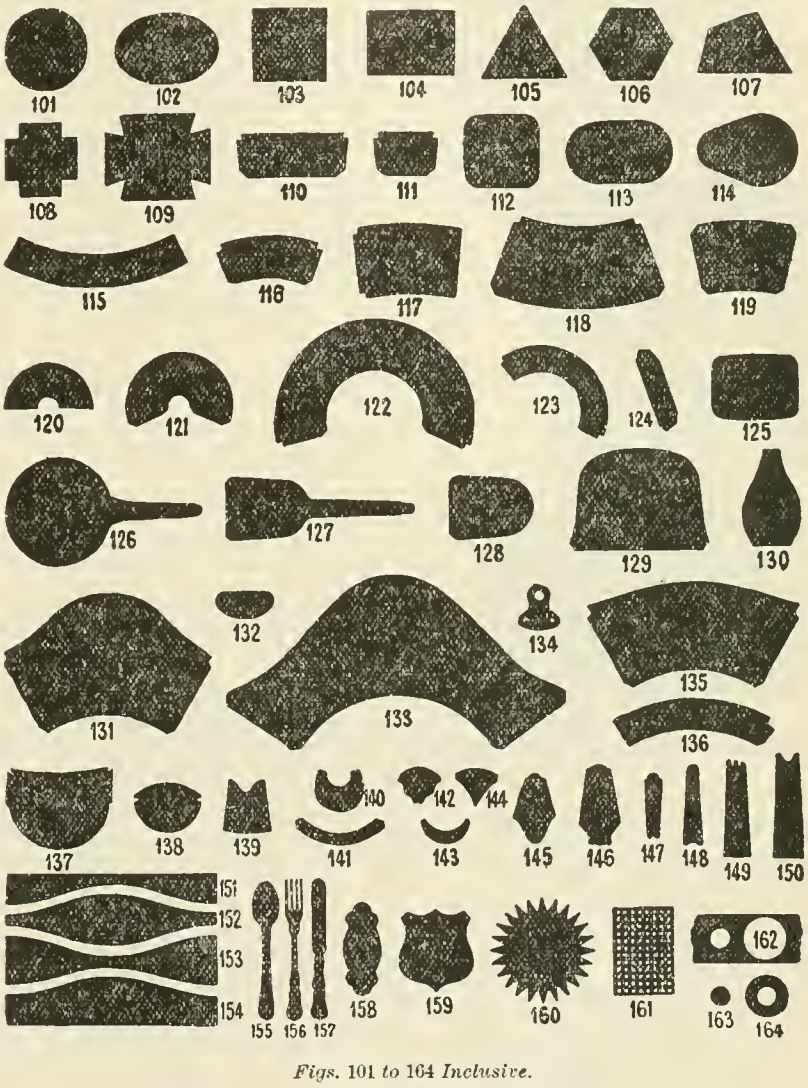


Fig. 100.



Figs. 101 *to* 104 *Inclusive.*

Bevels of Shear Blades.

The bevel of shear blades has been already referred to as being usually about 75°. This angle of course appears in cutting dies, as A and A′, Fig. 94. Its object is chiefly to facilitate the grinding and hammering up practiced in repairs, although it is supposed that the metal is cut easier, with a little less power, than when the edges are at an angle of 90°, as in Fig. 87. Just how much power is saved thereby I have at present no accurate data regarding. In some cases, however, it is better to make the surface of dies perfectly flat, with a 90° angle, to avoid the little notch that is left in the work, as shown at *n n*, Fig. 90.

Strippers.

It is usually necessary to supply a male cutting die with a stripper, which in general consists of a stationary ring surrounding it and extending slightly below it when in upper position, as shown at S, Fig. 96. This is usually secured either to the press frame back of the ram or to the lower die or bolster, it being bent downwardly in such case to meet the place of fastening. The latter method serves a good purpose where the downwardly extending portion is not in the way of the sheet, as for instance where the sheets are narrow. If, however, it is desirable to move the sheet back a considerable distance, as for cutting another row of holes forward of the first row, &c., a stripper is apt to be in the way if mounted as last mentioned. Sometimes a stripper is a ring sliding upon the male die and driven down by springs abutting thereagainst. In still other cases it slides in this way, but is struck upon the up stroke by stationary abutments fastened to the press frame.

Gauges.

In regard to gauges, they are too numerous in design to be described in detail here. In their simplest form they are simply round pins, projecting from the upper die, as at G G′, Fig. 96, for back gauges and G″ for an end gauge, so called. Sometimes, however, gauges are so arranged as to confine a strip of metal at both front and back, and in many cases the end gauge G is arranged as a finger gauge, so that it will move up and down automatically by the action of the press at the proper time. When the feeding and gauging is done by hand, however, the work is lifted so as to slide over the top of G″.

Speed of Dies.

In regard to the best speed for running cutting dies, but little has been accurately determined. The ordinary quick running presses in common use, making from 50 to 150 strokes per minute and generally averaging perhaps 100, seem to work well for shearing and punching most of the common metals which are not over ¼ inch thick. An exception, however, should be made for cast steel, for cutting which a press should be geared so as to run very much

PRESS WORKING OF SHEET METALS.

slower than for mild steel, iron, brass and the softer metals. The reason for this is simply to get more durability in the dies, as the edges seem to get dull very rapidly at quick speeds. For punching metals over ¼ inch thick it is usually better to use what is known as a geared press, which generally makes from 25 to 75 strokes per minute. In the cases mentioned presses of short stroke, usually 2 inches or less, are referred to. Where a press happens to have a much longer stroke, it is of course necessary to run at a lower number of strokes per minute to secure the same actual cutting speed.

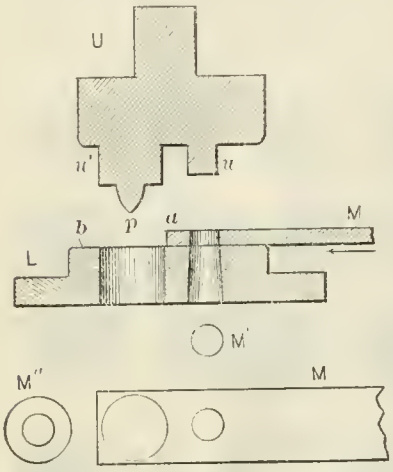


Fig. 165

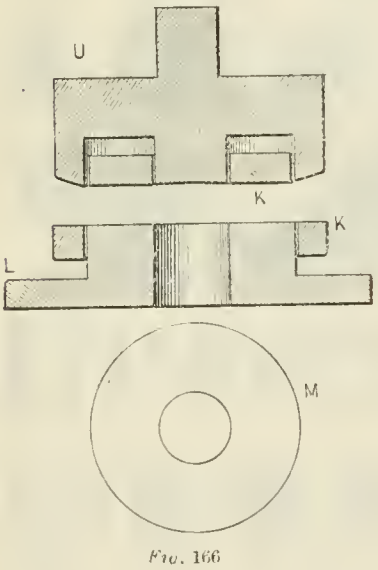


Fig. 166

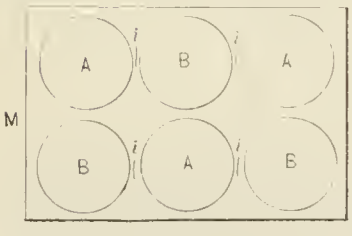


Fig. 167.

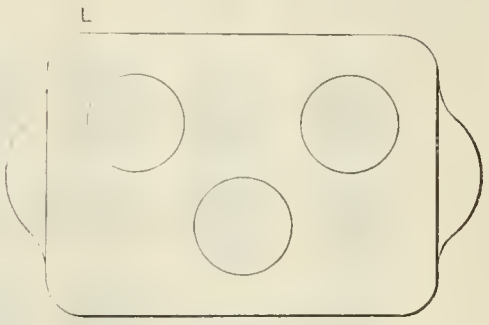


Fig. 168.

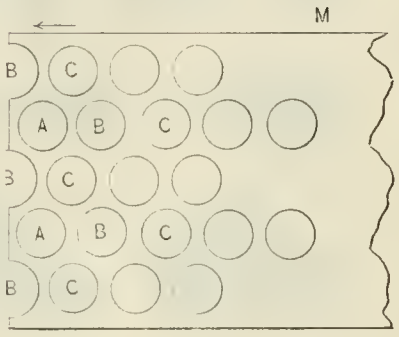


Fig. 169.

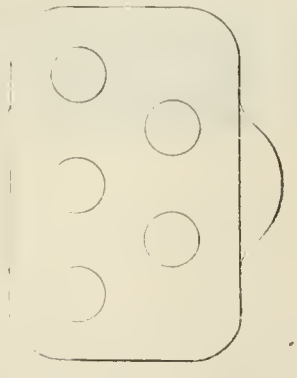


Fig. 170.

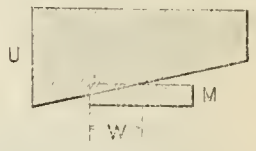


Fig. 171.

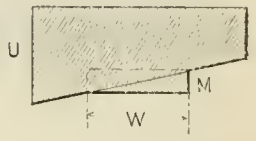


Fig. 172.

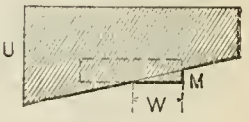


Fig. 173.

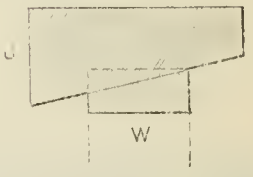


Fig. 174.

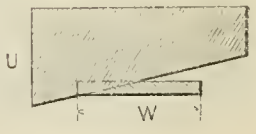


Fig. 175.

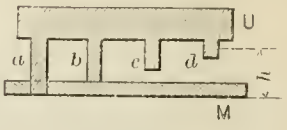


Fig. 176

PRESS WORKING OF SHEET METALS.

Pressures.

In regard to pressure required for shearing and punching, it may be said in general that the actual force required to shear a given unit of section is slightly less than that required to pull apart the same section by stretching—that is to say, in most of the ordinary ductile metals, such as steel, iron, brass, copper, &c. In other words, the ultimate shearing strength of these metals is a little less than their ultimate tensile strength, sometimes (as observed with certain steels) being only about 75 per cent. thereof.

This is assuming sharp cutting edges, however, which are not always present. Considering the fact that such dies are often dull, a safe general rule in providing a press for doing certain shearing or punching work would be to have it capable of safely exerting and resisting a force powerful enough to tear apart 1 square inch of section of the particular metal to be used for each square inch which is required to be sheared. In the case of mild steel this may be considered roughly as about 60,000 pounds per square inch; with wrought iron 50,000 pounds, and with other metals less, but always in the same way, according to their tensile strength, which may generally be found in any engineering reference book—that is to say, in cases where the author of the book has taken the trouble to mention the particular metal which the reader happens to want, which is not always.

To give an example: Supposing a press user wishes to shear off bars of iron 1 inch square, or bars 2 inches by ⅓ inch, or 4 inches by ¼ inch, or to punch a hole 1 inch in diameter (which is about 3 inches round) in iron ⅛ inch thick, or 2 inches diameter in a sheet ¼ inch thick, or 12 inches diameter in a sheet $\frac{1}{32}$ inch thick. In any of these cases he will wish to cut an actual section of about 1 inch square. He will, therefore, need to use a machine which will give 50,000 pounds pressure at the beginning of the cutting operation, or, more accurately speaking, a little after its beginning, when some slight crush-

ing of the metal has taken place. This initial pressure, for instance in the case of cutting off a bar 1 inch square, will not have to be maintained during the whole 1 inch of ram descent while the cutting is going on. This is because the resistance will soon begin to decrease, probably after the first $\frac{3}{8}$ inch or $\frac{1}{2}$ inch of descending, ceasing entirely after about $\frac{3}{4}$ inch of motion, as at this time the bar will have been so disintegrated as to fall apart before being pushed entirely down to the amount of its own thickness.

The maximum pressure necessary, therefore, for shearing proper is measured by the amount of cross section to be cut, and may be formulated thus: Taking P=pressure in pounds required from ram, W=width and T=thickness in inches of bar to be sheared off, and S=shearing strength per square inch in pounds of the material of the bar, we have: WT=area of section cut and SWT=total initial pressure.

Hence P=SWT, that is, providing there is no dip to the blades.

Applying this rule to punching, we let W=circumference, or length of contour line, of the hole, which is really the width to be sheared. For round holes, taking D=diameter in inches, we have W=Dπ (or 3.14 times D). For square holes, taking D'=short diameter, we have W=4D'. As before stated, a rule easily remembered and one that is on the safe side is to let S=50,000 for iron and tin plate.

The rule just given must, of course, be modified in favor of less pressure requirement wherever it is practicable to use dip upon one of the blades or dies. Figs. 171, 172 and 173 show successive stages of the descent of an upper blade, U, upon a bar of metal, M. In the first position it will be seen that the practical width of cut W is only about one-half that of the bar, while in the second it has become equal to the whole width of bar, and this is evidently the maximum width upon which it will act. The average thickness, however, in this position is but one-half that of the bar, and the area of metal yet to be cut is measured by the triangle just below the blade, which is evidently but one-half the area of the bar's cross section. In the last position the width of cut has been reduced. From these diagrams it will be seen that a blade that has as much dip as that shown will require only about one-half the pressure required by a blade without dip, and this is nearly correct, except that some excess would be required to bend and twist the bar, as in Fig. 93. In Fig. 174 is shown a bar twice as thick as before, and it is here evident that when the width of cut has reached that of the bar itself there remains about three-quarters of the area yet to be cut. Consequently the pressure is reduced by the dip something less than one-quarter only. In Fig. 175 is shown the opposite extreme, where only about one-half the width of the bar and one-half the thickness are at the same time being contributed as factors to the area being sheared. Consequently the pressure required is only a little more than one quarter of what it would be with a dipless blade. In Fig. 176 is shown a gang of punches, *a*, *b*, *c*, *d*, *a* having just reached through the bar of metal M when *b* is ready to commence. In the same way *b* will reach through when *c* commences, &c. Thus it is obvious that the pressure required at any time is only that due to the resistance of one punch, but that the whole hight traveled by the ram while doing its work is represented by *h*, which is four times the thickness of M, or, in general, as many times its thickness as there are punches, providing they are set with this amount of dip. An analysis of the preceding diagrams will show that the same rule holds good—viz, that the maximum pressure required is approximately in inverse proportion to the working distance traveled by the ram.

In estimating, therefore, the necessary pressure for any given pair of dies, the pressure required for flat dies without dip should first be ascertained by the formula given above, and then a reduction should be made in proportion to the increase of time during which the dies are doing their work over that due to the thickness of the metal itself, as caused by the particular amount of dip that may be present in the dies.

The pressure data given assume an upper die or punch of the same diameter as the die which it enters, such construction insuring a parallel hole through the metal. This close fitting is usually practiced with metals below $\frac{1}{16}$ inch thick, such as tin plate, &c., but is absolutely necessary with very thin metallic sheets and with soft substances, like cloth, leather, paper, &c. Indeed, a rule frequently used by the writer for accurately testing such dies has been to make them cut wet tissue paper cleanly all around. With thick metals, however, as in boiler making, bridge work, &c., it is customary to make the punch considerably smaller than the die. In some extreme cases this has been as much as one-fifth of the thickness of the metal, which has been proved by certain interesting experiments tried by the Messrs. Sellers some years ago to be a proportion that requires the minimum pressure. Practically, the amount of clearance between punch and die is usually less than this, varying generally from $\frac{1}{32}$ inch to $\frac{1}{16}$ inch in metals not over $\frac{1}{4}$ inch thick. With such clearance the pressure is considerably lessened, but the holes are of course conical. In some cases this may happen to be an advantage, as when the large end can be turned outward in riveted joints, &c., but in other cases it is a detriment.

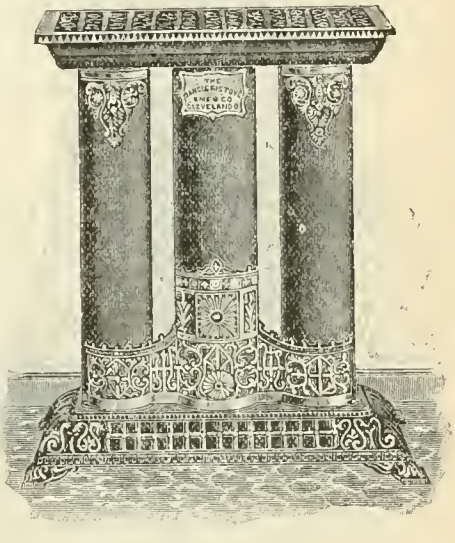
The punching pressure required when holes are located very near the edge of a sheet is somewhat lessened on account of the spreading of the metals sidewise, but this does not amount to much in practice, and such punching should be avoided.

Regarding the pressure required for stripping metal from a punch during its ascending stroke, I have no reliable data at hand. It varies considerably with the amount of punch and die clearance, the smoothness of the punch and the squareness of the stripper therewith, together with its rigidity, &c. It is undoubtedly a good deal less than one-tenth of the punching pressure, even in extreme cases. A series of experiments in this direction are certainly very desirable, and the writer hopes upon some future occasion to be able to publish an experience of this kind which he has not yet enjoyed.

Regarding the kinds of presses used for the cutting processes which have been described in this chapter, it may be said that, like the Scotchman's whisky, there are no bad kinds. In other words, almost any sort of a press is sometimes suitable—the nearest approach to an exception to this statement being perhaps the drop press tribe, whose members are generally employed in other work.

The Dangler Hot Air Radiator.

In the accompanying illustration we present a general view of a hot air radiator which has recently been placed upon the market by the Dangler Stove & Mfg. Company, Cleveland, Ohio, and for which a patent was granted last month. The radiator is referred to by the manufacturers as being new in principle, conveying its heat upward through the center flue, passing it down the two side ones, and discharging it through the openings in the base. The air by this arrangement is crowded into the top of the radiator, causing the flues to become very hot, and while radiating a great deal of heat from the top and sides, it forces the air downward to the openings in the base, enabling persons to warm their feet as readily as by means of a base burning



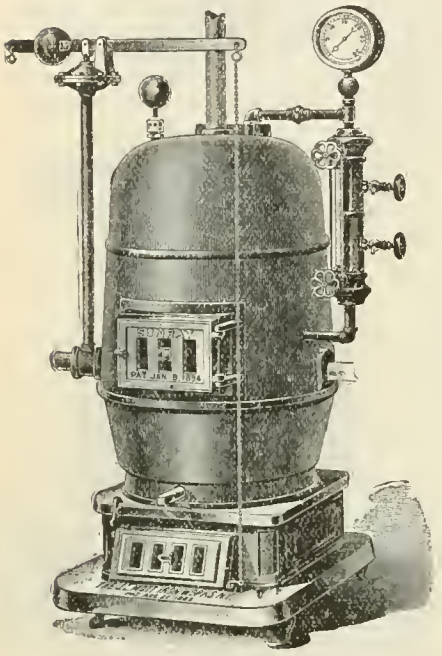
Dangler Hot Air Radiator.

parlor stove. The burner in this radiator is placed at the bottom of the center flue, which, it will be noticed, is a trifle shorter than the ones at the right and left, and is also made a trifle larger in cross section so as to be able to carry a supply of air sufficient for the other tubes. The burner frame is formed with a tubular ring having jets at intervals, and connected at its center by cross tubes and with the gas supply pipe, which passes up centrally through the base, serving as a support for the frame. By means of the construction employed there is a free circulation of air from beneath, both within and without the burner ring. The manufacturers refer to the fact that the distance which the air is forced to travel from the time it enters the central tube until it is discharged through the openings in the base is sufficient to retard the flow just enough to insure good radiation. The arrangement is also such as to render the heat easily controlled, allowing it to be distributed fast or slow, as may be desired. The grating shown at the bottom of the radiator can be easily removed for the purpose of dusting. The appearance of the device is neat, some of the parts being treated with nickel, which forms a pleasing contrast with the black iron surfaces. The radiator shown herewith has three tubes, while other sizes have four, six, eight and twelve tubes. The manufacturers state that this radiator has proven very popular with the trade, and that during the past winter and fall they sold large numbers.

STEAM AND HOT WATER.

The Sunray Steam Boiler.

The accompanying cuts illustrate a new steam heater just placed on the market by the J. L. Mott Iron Works,



Sunray Steam Boiler.—Fig. 1.—Showing Complete Apparatus.

New York and Chicago. The heater is designed for small residence work and for furnishing steam for coffee rooms, steam kettles, carving tables or any

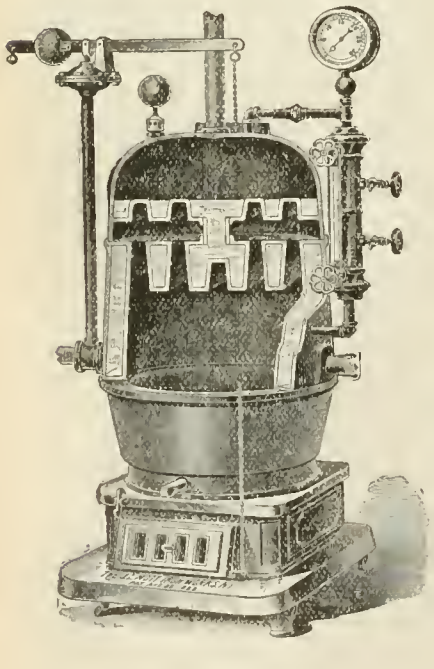
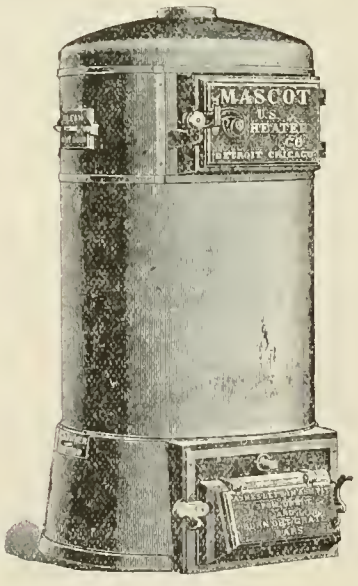


Fig. 2.—Sectional View.

other purpose requiring a moderate supply of steam at a low pressure. It is claimed that technical tests of this heater show a very high rate of economy and efficiency. It has an ample fire chamber and the heating surface is brought in direct contact with the fire, thus making a quick and powerful steamer. Fig. 1 gives the external appearance of the heater, and Fig. 2 is a sectional cut showing arrangement of fire surfaces, water line and steam chamber. It will be seen from the illustrations that no steam or water joints are left for the fitter to make, as the generating part of the heater is all put together before shipment; also that no packed or washer joints are used in its construction. It is easily handled and can be taken in at any ordinary door or window. It is claimed by the makers that this heater can be set up ready for piping in one-half hour after it has been unloaded at the building. This heater is made in five sizes, with grates 14, 17 and 21 inches in diameter, and is capable of supplying from 150 to 400 square feet of heating surface, or the equivalent in any other service it may be used for.

The Mascot Heater.

We show in the accompanying illustrations views of a new heater, known as the Mascot, that is brought out by the United States Heater Company, Detroit, Mich., with Chicago branch at



The Mascot Heater.—Fig. 1.—General View of Mascot Hot Water Heater.

100 Lake street, and New England selling agents Gilchrist & Taylor, 106 High street, Boston, Mass. The heater shown in the illustrations is intended for both steam and hot water. Fig. 1 is an exterior view of the hot water heater, while Fig. 2 is a broken view of the steam heater. The constructions are essentially the same, but the upper chamber in the steam heater is larger. The water space is inclosed between a double shell, the inner surface, as shown in Fig. 2, being corrugated, giving an extended surface and increasing the efficiency of the apparatus. In the hot water heater the steam dome is replaced by a top header or distributing chamber. It is mentioned that the Mascot is so arranged that ample heating surface is presented, while the products of combustion are made to strike first the top

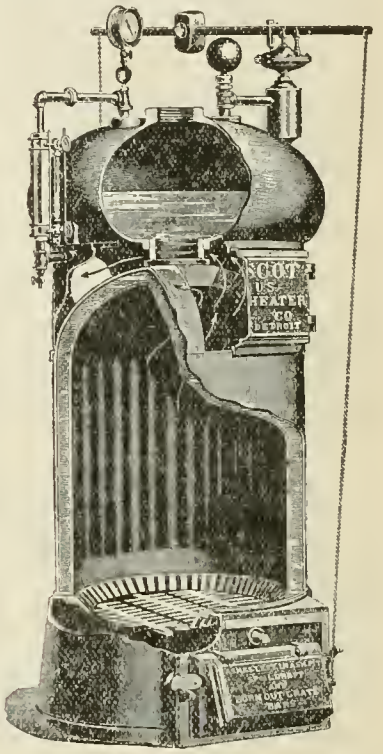


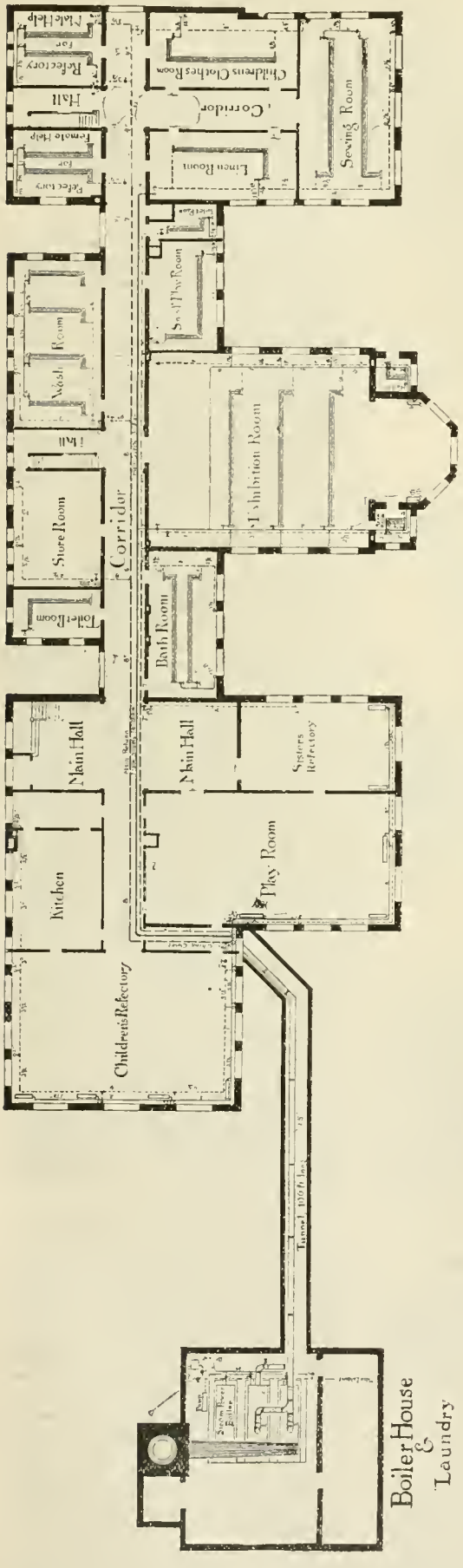
Fig. 2.—Broken View of Mascot Steam Heater.

of the heater proper, then the top header or steam dome before finding an exit through the smoke pipe. A special feature to which attention is directed is the ease with which it may be cleaned. It is also easy to handle and set up. The Mascot hot water heater is made in three sizes with diameter of grate 15, 18 and 21 inches, adapted to supply from 275 to 475 square feet of radiation in addition to mains. The Mascot steam heater likewise is made in three sizes with the same diameters of grate, adapted to supply from 175 to 350 square feet of radiation in addition to mains.

THE HOWARD THERMOSTAT COMPANY of Syracuse, N. Y., with New York office at 210 Water street, have brought out an improvement on their thermostat regulator, by which the check of the fire in the furnace is accomplished through the ash pit, thereby avoiding, it is said, any possibility of gas escaping, and affording a quick and efficient check to the fire without admitting cold air into the smoke pipe. They also have in process of manufacture a larger cylinder designed to furnish sufficient check for the largest furnace or heating apparatus constructed. This method of regulating is adapted to hot air, hot water or steam heating apparatus.

An Extensive Hot Water Plant.

The Ringen Stove Company, St. Louis, Mo., have recently completed an extensive heating contract in the St. Joseph's Orphan Asylum at St. Louis. There is a total of 19,500 square feet of hot water radiation, in addition to the mains, which are all exposed and utilized as heating surfaces. The radiation is supplied from two multitubular boilers, 18 x 60 inches in size, with 72 4-inch flues in each. The location of the boiler is shown in Fig. 1, which is a basement plan. Attached to the boilers is a Hawley down draft smokeless furnace, guaranteed by the manufacturers to effect a saving of 25 per cent in fuel. The boiler house is situated 102 feet west of main building. The boilers are connected so that either or both can be used for the purpose of firing heavy or light, according to the weather. The flow and return from each boiler are 12 inches in diameter. The two 12-inch supplies connect into one 15-inch main trunk supply, and the two 12-inch returns into one 15-inch main trunk return, which are the sole supply and return of the building, all the water passing through them. The 15-inch supply and return mains pass through a tunnel connecting the two buildings, the pipes being suspended on extra heavy rollers to permit of expansion. This tunnel is brick lined, arched, and is 6 feet high by 5 feet wide. After the 15-inch pipe enters the building it rises to the ceiling of the basement, and from this point one 4½-inch is taken first to supply the radiators situated on the floor of the basement to heat what is known as the children's refectory, playroom and sisters' refectory. Returns from these three rooms are carried back on base board into the tunnel direct and here connected with the main return. The main trunk continues, 14 inches in size, on the ceiling of the basement 130



An Extensive Hot Water Plant.—Fig. 1.—Basement Plan of St Joseph's Orphan Asylum.

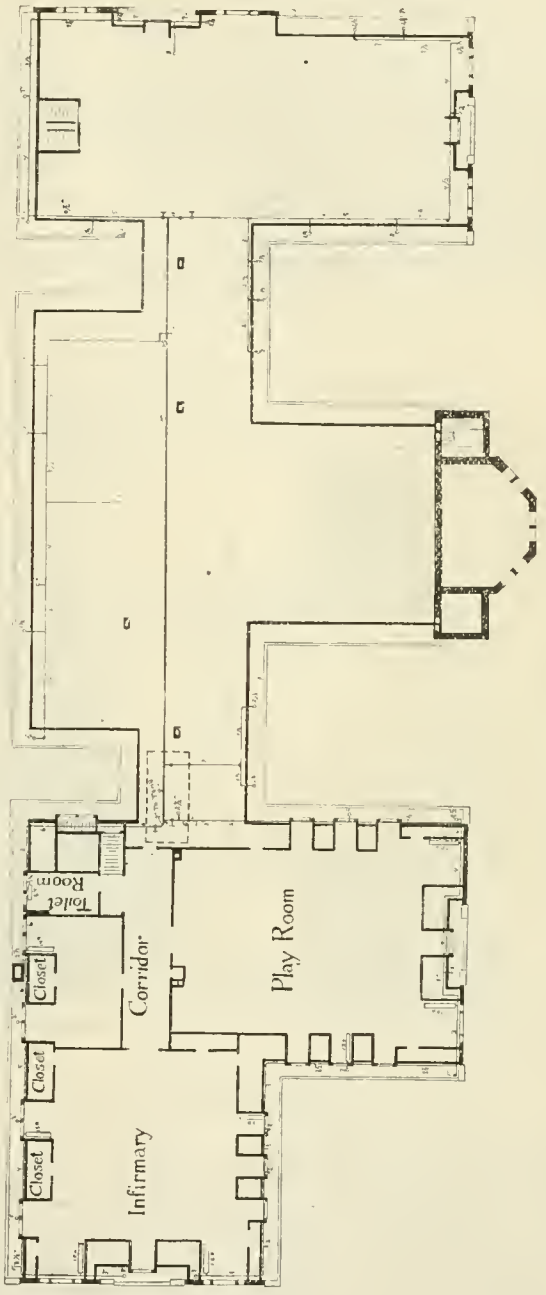
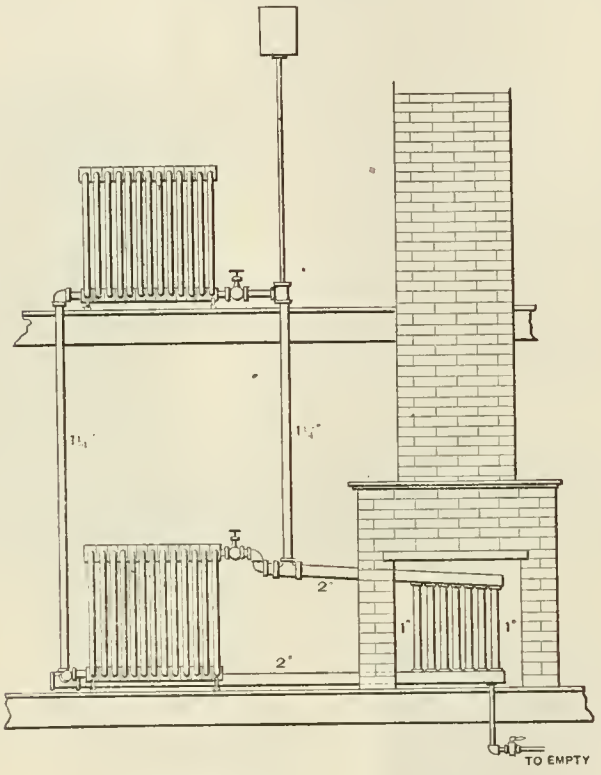


Fig. 2.—Attic Plan of St. Joseph's Orphan Asylum.

feet, and at this point a 5-inch main is taken off for the supply of radiation in the chapel. Then the main trunk continues, 13 inches in size, on the ceiling to the bottom of the trunk riser for 105 feet; this riser, being 13 inches in size, goes to the attic, a hight of 42 feet. A plan of the attic is shown in Fig. 2. From here one 5-inch and one 6-inch main are first taken off to supply all radiation on the eastern front part of the building. The trunk main continues, 12 inches in size, westward 36 feet, where a 5-inch main branch is taken off to supply all radiation on north side of the building. The main trunk continues, 10 inches in size, 110 feet, and at this, the higheat point, the expansion tank is suspended over the main. At this point two 6-inch mains are taken off, supplying all radiators in the western portion of the building. The total distance traveled by the water before the last radiation is supplied measures 726 feet, and upon several tests a loss of no more than 4° to 6° of heat was recorded by a special hot water thermometer placed at convenient points. The total distance traveled over by the water in main trunk from the beginning of flow to the end of return measures 1000 feet. It was found necessary to construct special fittings throughout this entire work to promote easy and rapid circulation. Any portion of this immense plant can be shut off by a system of valves, making any part independent of any other part. Standard radiators, with top openings, are used, the flow and return being in the same loop, and the entire system is vented automatically.



Radiators Heated from Open Fire.

Radiators Heated from Open Fire.

From G. T. K., *Radford, Va.*—A copy of *The Metal Worker* of January 27 having come to my hands, it is with interest I have noticed the article on "Radiator at Boiler Level." Herewith I give you a sketch showing two rooms heated from a water back in fire place on level or same floor as lower radiator.

The winter of 1892 the back having burned out of my fire place, in which I keep constant fire, the suggestion came, why not utilize this heat? As receiver for a plumbing company I had use of tools, and a friend gave me piping and radiators from a house which burned, and the following summer I put in this apparatus. It works entirely satisfactorily by heating one room at a time, controlling by valves, in very cold weather; in moderate weather both rooms are comfortable. The water back is made of 2 inch pipe for horizontals, and the down pipes, seven in number, are of 1-inch pipe. Two-inch pipe runs through chimney and is reduced to 1¼ inches for radiator connections. The return pipe from the upper radiator connects with 2-inch return at lower radiator, passing behind lower radiator, drops below floor level in chimney and in ash pit. An 18-inch grate hangs in the usual place. The system holds about 35 gallons of water and evaporates 1 quart a month. An emptying cock is placed in the cellar.

HEATING NOTES.

M. Mahony, Troy, N. Y., follows his March calendar card with a similar one for April. The variation is in the decoration, the one for the current month being truthfully representative of a showery day.

"What Are We Here For?" is the catching title of a pamphlet issued by the United States Heater Company, Detroit, Mich. It is needless to tell what the answer to this question is, for every one knows the Capitol, Hecla and Mascot heaters made by this firm. Following a dissertation on the boilers made by the United States Heater Company is a report on the Capitol hot water heater by Leicester Allen, a well known authority in such matters. At the close are extracts from letters telling of the good results attained by these boilers.

T. R. McMann, 56–60 Gold street, New York, is one of the old houses in the pipe and fitting trade, some men of the establishment having had nearly a half century's experience and the business having been started early in the "Sixties." The progressiveness of the house is shown in their method of handling some large extra double heavy pipe that weigh 800 pounds to the length that is being cut for an order. By means of a crane over the sidewalk, and an overhead railway in their shop, one man can bring these pipes to the machine and cut and thread them without assistance.

Johnson & Co., 71 John street, New York, agents for the Gurney Hot Water Heater Company, have a fine showroom in which they display a line of the 300 Series and Crown hot water heaters and Gurney radiators. The line is attractively painted and is displayed on platforms. The latest attraction is the new Gurney steam boiler, which is conspicuously located. A feature of the showroom that attracts not a little attention is the method of heating, which is from a small boiler of the 300 Series and radiators all on the same floor.

The Raymond & Campbell Mfg. Company of Middletown, Pa., manufacturers of the Sun heating boiler, have made some improvements in the boiler which will be appreciated by the trade. The draft door is now placed in the center of the ash pit door, and the position formerly assigned to the draft door is now occupied by a mica door, through which an attendant may observe the state of the fire when shaking down. The grate has been remodeled, its present form insuring durability and better combustion. The shaker is of entirely new design, being so adjusted that the lever works from the front and toward the attendant, instead of sideways as in the old style. The boiler has been generally redressed and presents a pleasing appearance. The company report that business in the boiler department last season assumed large proportions and sorely taxed their facilities for handling it. Anticipating their share of trade during the coming season they have added to the equipment of their boiler and erecting shop and have increased their facilities to quite an extent. At the present time they have upward of 200 boilers on the floor, in course of erection. They have just shipped a carload to Littlefield & Co. of Wakefield, Mass., and have other large orders awaiting shipment.

The Peerless is the name of a flange steel steam and hot water boiler which Geo. H. Bell & Co., 114 Nassau street, New York, are introducing. They will open a showroom at 41 Dey street May 1, and display a line of samples. The boiler has been previously noticed in our columns and is cylindrical in shape, consisting of an inner and outer annular water space, so arranged and connected as to cause an indirect draft. The outer water chamber extends up and forms a part of the boiler proper, which hangs directly over the fire. Pipes lead from the inner water chamber up into the center of the bottom of the boiler. The apparatus is provided with a labor saving grate, and both economy and great heating power is claimed for it. It is made in four sizes, with fire pot from 20 to 36 inches in diameter, and rated to carry from 200 to 1400 feet of radiation.

OBITUARY.

ARAD T. FOSTER.

As briefly announced in our last issue, Arad T. Foster, whose portrait is presented herewith, died suddenly, of apoplexy, at his home, 47 New York avenue, Brooklyn, N. Y., on March 29. Mr. Foster was well known and highly esteemed by the plumbing and heating trades, from his long connection with two prominent manufacturing concerns in this city catering to those trades—namely, the Haydenville Mfg. Company, 73 Beekman street, and Peck Bros. & Co., 47 Cliff street. At the time of his death Mr. Foster was president and general manager of the first named concern and vice-president of the latter.

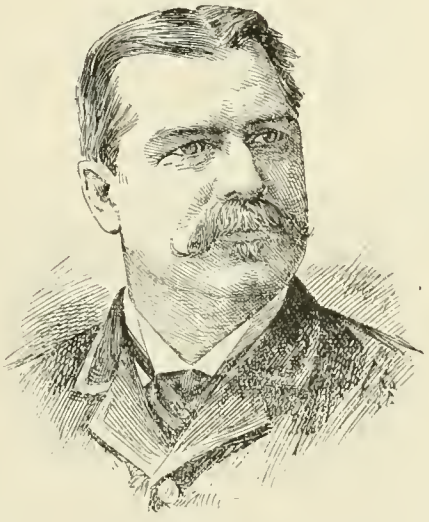
Arad T. Foster was born in Canada on April 12, 1837. His father and mother were descended from some of the most distinguished families in New England. The former was a renowned physician and became a member of the Canadian Parliament and Governor of the Dominion College of Physicians and Surgeons. Coming to the United States in 1864, Arad T. Foster became connected with the plumbing supply house of Peck Bros. of New Haven, Conn., as manager of the New York branch. For 30 years he was closely identified with this concern, of which he was vice-president at the time of his death. He was also president and general manager of the Haydenville Mfg. Company, brass and iron founders and manufacturers of water, gas and steam goods, a competing concern established in 1845 by the late Governor Hayden, at Haydenville, Mass., where the firm's works are still located. This corporation was bought out by Mr. Foster and the Peck Brothers in 1884 and has been owned and operated by them since that date.

Mr. Foster was for a number of years a member of the New York Metal Exchange, and was chosen president of the Manufacturers' National Association, at Pittsburgh, in 1886, to which position he was re-elected at each succeeding annual meeting. Since its commencement, his business career was a successful one. He was a man of cool judgment and dogged perseverance, united to the strictest integrity; generous in his nature, kind and sympathetic toward the unfortunate, and considerate to his employees. Of sterling Christian character, his religion was brightly reflected in all his domestic, social and business relations. In the words of the funeral address of his close friend and pastor, the Rev. Dr. Theo. L. Cuyler of Brooklyn, it was his religion "that made his business life so upright and his domestic life so happy. He had a large, warm heart: and I never knew a more kind and courteous gentleman. We cannot afford to lose such men as Mr. Foster. Such men are needed in the commercial world and in the community. He was a true man and bound his friends to him with 'hooks of steel.' He not only served God in the church, but he served Him all through the week by his life of strict integrity."

Mr. Foster was twice married. By his first marriage he had two promising sons, both of whom died in California, the younger having deceased but a few months ago. Mr. Foster's stepson, Cuyler K. Sanborn, was associated in business with him, and is now vice-president and secretary of the Haydenville Mfg. Company.

Mr. Foster was conspicuous in Masonic circles and a member of the Union League Club of Brooklyn. He was also an active and esteemed member of the Lafayette Avenue Presbyterian Church in that city.

On Monday, April 30, and Tuesday, May 1, during the day and evening, there will be a large exhibit of drawings made by members of the freehand, mechanical, architectural and carriage drafting classes, also manuscripts from the penmanship, bookkeeping, shorthand and typewriting, arithmetic, steam engineering and electricity classes of the Young Men's Institute, 222 Bowery, New York. All persons interested in such work are invited to visit the rooms and inspect the work done by the pupils. On Tuesday evening, May 1, the closing exercises of the classes will be held in the Institute Hall. Certificates of progress, diplomas and prizes will be awarded and there will be special music and addresses. The work of the school year 1893-94 has been very satisfactory, with an enrollment of about 635 young men in 11 studies. The committee are planning to add one or two new subjects to the curriculum for 1894-95. The fall term will begin October 3, 1894. Enrollment can be made any time during the spring, summer or early fall.



ARAD T. FOSTER.

The opening of the Chilean National Mining and Metallurgical Exposition, which was to occur at Santiago during the current month, has been postponed by decree of the Supreme Government until September next. The postponement has been decided upon in order to give opportunity for more thorough preparation by the Government, and because it was thought impracticable for exhibitors to prepare and forward their exhibits in the short time allowed. The exhibition will be divided into the following sections: Motive power, electricity, mining machinery, mechanical preparation of minerals, metallurgy, chemical industries, statistics and plans, and mining and metallurgical products. The Government will convey gratis to the exhibition all articles comprised in the above classifications which it may be desired to exhibit. The Government will also pay the passage money by sea and land of the workmen and operatives whom exhibitors may desire to send for the purpose of setting up and running the machinery and apparatus they exhibit. Application for space should be made to the Chilean Legation at Washington, D. C.

A New Aluminum Solder.—One of the most perplexing questions encountered in the development of the uses of aluminum has been that of soldering the metal. In many instances the effort has been made to get around the difficulty by riveting, a method frequently awkward and often leading to structural weakness. A series of tests were recently made of a solder which is being introduced by the Alsite Aluminum Company, 106 and 108 Liberty street, New York. Among the tests made were butt welds of sheets and plates, which under tension showed the soldered joint to be so well made that rupture took place in every instance outside of the joint. Strips connected by butt soldering were twisted in the vise without opening the seam, and soldered tubing has been successfully drawn recently. The surfaces to be soldered are cleaned by dipping in a hot solution of soda or potash, then dipped into nitric acid, rinsed in hot water and dried. Sometimes the surfaces are cleaned by filing the edges to be joined. The parts to besoldered are heated as hot as can safely be done without melting and a small portion of the solder is spread over the edges by means of a soldering brush, which should be kept heated during the process. The edges are then joined and more solder is applied and spread evenly over with the brush. During the entire operation the metal is kept as hot as possible, and it is completed when the solder becomes distinctly white or the aluminum assumes a reddish hue. Authorities on the working of aluminum have acknowledged that soldering by the Alsite process accomplishes results not hitherto attained.

Philadelphia is to spend some $14,000,000 this season on city improvement work of a permanent character. This includes a subway for the Reading Railroad, miles of new street pavement, a better sewerage system, &c. This work will furnish employment for some thousands of the unemployed in the coming months.

The approaching consolidation of some of the largest Chicago packing houses is stated to be a fact.

TIN PLATES.

American Tin Plate Manufacturers.

The following revised list of concerns engaged in the manufacture of tin and terne plates in the United States is extracted from the report of Col. Ira Ayer, special Treasury agent, for the quarter ended December 31, 1893:

Revised list of firms or companies engaged in tin and terne plate manufactures, December 31, 1893. (*a*, made sworn return; *s*, manufacture suspended; *b*, building; ‖, making or preparing to make black plates; †, make only black plates; ‡, manufacturing—failed to make sworn returns.)

NOTE.—In the following list are included the names of such firms or companies, only, as were manufacturing, or had begun building operations, prior to December 31, 1893.

A. A. Thomson & Co., *a*, New York, N. Y.
Alan Wood Co., ‖ *s* †, Philadelphia, Pa.
Aliquippa Tin Plate Co., *s*, Aliquippa, Pa.
American Stamping Co., *a*, Brooklyn, N. Y.
American Tin Plate Co., ‖ *a*, Elwood, Ind.
American Tin Plate Machine & Mfg. Co., *a*, Linfield, Pa.
American Tin & Terne Plate Co., *a*, Philadelphia, Pa.
Apollo Iron & Steel Co., ‖ *a*, Apollo, Pa.
Baltimore Steel, Iron & Tin Plate Co., *a*, Baltimore, Md.
Black Diamond Tin Plate Works, *a*, Philadelphia, Pa.
Blairsville Rolling Mill & Tin Plate Co., ‖ *a*, Blairsville, Pa.
Britton Rolling Mill Co., ‖ *b*, Cleveland, Ohio.
Burn Stamping & Mfg. Co., *s*, Chicago, Ill.
Canonsburg Iron & Steel Co., ‖ *a* †, Canonsburg, Pa.
Chicago Stamping Co., *b*, Chicago, Ill.
Chicago Tin Plate Mfg. Co., *a*, Chicago, Ill.
Cincinnati Corrugating Co., *a*, Piqua, Ohio.
Cleveland Tin Plate Co., *a*, Cleveland, Ohio.
Columbia Tin Plate Co., *s*, Piqua, Ohio.
Cumberland Steel & Tin Plate Co., ‖ *a* †, Cumberland, Md.
Duquesne Tin Plate Works, *a*, Pittsburgh, Pa.
East River Lead Co., *a*, New York, N. Y.
Falcon Tin Plate & Sheet Co., ‖ *a* †, Niles, Ohio.
Griffiths & Cadwallader, *a*, Pittsburgh, Pa.
Gummey, Spering & Co., *a*, Philadelphia, Pa.
Hughes & Patterson, ‖ *a*, Philadelphia, Pa.
Indiana Tin Plate Mfg. Co., *s*, Atlanta, Ind.
James B. Scott & Co., *a*, Pittsburgh, Pa.
Jennings Bros. & Co., Ltd., ‖ *a* †, Pittsburgh, Pa.
John Hamilton, *a*, Pittsburgh, Pa.
Kirkpatrick & Co., Ltd., ‖ *a* †, Pittsburgh, Pa.
Lalance & Grosjean Mfg. Co., ‖ *a* †, New York, N. Y.
Laufman Tin Plate Co., *s*, Butler Junction, Pa.
Locust Point Iron & Steel Works Co., ‖ *a*, Baltimore, Md.
Marshall Bros. & Co., ‖ *a*, Philadelphia, Pa.
Matthai, Ingram & Co., *a*, Baltimore, Md.
McKinley Tin Plate Co., *a*, Wilkinshurg, Pa.
Merchant & Co., *a*, Philadelphia, Pa.
Meurer Bros. Co , *b*, Brooklyn, N. Y.
Morewood Co., ‖ *a*, Gas City, Ind.
Morewood Tin Plate Mfg. Co., *a*, Elizabethport, N. J.
New Castle Steel & Tin Plate Co., ‖ *a*, New Castle, Pa.
N. & G. Taylor Co., *a*, Philadelphia, Pa.
Norristown Tin Plate Co., *a*, Norristown, Pa.
Norton Bros., ‖ *a*, Chicago, Ill.
Philadelphia Tin Plate Co., *b*, Philadelphia, Pa.
Phillips Tin Plate Co., *a*, Philadelphia, Pa.
P. H. Laufman & Co., Ltd., ‖ *a*, Apollo, Pa.
Pittsburgh Tin Plate Works, *a*, New Kensington, Pa.
Record Mfg. Co., *a*, Conneaut, Ohio.
Saunders, Fielding & Bond, ‡, New York, N. Y.
Somerton Tin Plate Works, ‖ *a*, Brooklyn, N. Y.
St. Louis Stamping Co., ‖ *a*, St. Louis, Mo.
United States Iron & Tin Plate Mfg. Co., ‖ *a*, Demmler, Pa.
Wallace, Baufield & Co., Ltd., ‖ *a*, Irondale, Ohio.
Western Tin Plate Works, *a*, Belleville, Ill.

Total number of companies December 31, 1893	56
Number that made sworn returns of manufacture	45
Number of companies manufacturing, but failed to make sworn returns	1
Number of companies manufacture suspended	6
Number of companies building	4
Number of companies making or preparing to make black plates	22
Number of companies that made sworn returns of black plate production	17
Number of companies makiug only black plates	7
Number of new companies	4

SCRAP.

THE QUARTERLY REPORT of the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., to the Special Agent of the United States Treasury Department showa that during the quarter ending March 31, 1894, the output of the above concern was as follows: 2,020,767 pounds of tinned plates; 1,186,360 pounds of black plates for tinning, or a total of 3,207,117 pounds. Of this 2,867,648 pounds were lighter than 63 pounds and 339,469 pounds over 63 pounds per 100 square feet.

THE BRITISH BOARD OF TRADE STATISTICS for March, 1894, show the shipments of tin and terne plates from the United Kingdom to the United States during the month to have been 16,000 tons, as compared with 31,000 tons in March, 1893. The total tin plate exports to all countries during the month of March were 25,000 tons, as against 42,000 tons last year.

A PATENT has been granted in England to F. Player and D. Mainwaring of Ystalyfera, South Wales, for a new method of cleaning metal plates. The system is thus described: Pairs of rollers having surfaces of suitable material, the two rollers of each pair revolving at different speeds, are kept apart the proper distance by springs inserted between the bearings, the slack being taken up as the surfaces wear. The plate is delivered to the first pair, and is by them passed on to the next without the intervention of any carrying rollers. In consequence of the rollers turning at different speeds, both surfaces of the sheet are rubbed alternately by the top or bottom rollers of the successive pairs, or the rollers may be joined by belts which would be running at different speeds, and the plate would be simultaneously carried forward and rubbed between the surfaces of the upper and lower belts. For polishing tin plates it is only necessary to pass them through the machine, but for removing the grease the rollers or belts must be fed with bran or some other cleaning material.

The Production of Tin Plate.

The special report to the Secretary of the Treasury by Ira Ayer, special agent, Treasury Department, relative to the production of tin and terne plates in the United States during the quarter ended December 31, 1893, with comparative statements of production dated March 22, 1894, has been received, and shows the following results of his investigations:

A total of 39 firms manufactured 27,351,241 pounds of tin and terne plates proper, against an output of 27,145,430 pounds by 35 firms during the previous quarter. Of the output for the quarter, 15,907,669 pounds, more than 58 per cent., was made from sheets rolled in the United States. Of this amount, 15,309,009 pounds, more than 96 per cent., consisted of the class of plates weighing lighter than 63 pounds per 100 square feet. Of the commercial plates made during the quarter, 14,682,045 pounds were coated with tin, and 12,669,196 pounds were terne coated. More than 96 per cent. of all the commercial plates belonged to the lighter class. The quantity of American sheet iron and steel made into articles and wares tinned or terne plated was 1,244,707 pounds. This makes the aggregate output for the quarter from all sources 28,595,948 pounds; previous quarter, 28,198,293 pounds.

The production for the quarter subject to comparison with net imports under the recent ruling of the Department, inclusive of products from American sheet iron and steel, tinned or terne plated, was 16,553 716 pounds, as compared with 9,257,610 pounds during the previous quarter. The total for the two quarters was 25,811,326 pounds.

Three companies, Hughes & Patterson of Philadelphia, Pa.; the New Castle Steel & Tin Plate Company of New Castle, Pa., and the Western Tin Plate Works of Belleville, Ill., made their first sworn returns to the Government. The works at New Castle are complete, both for rolling and coating tin plates, and during the quarter operations were carried on in both branches of manufacture. The number of firms submitting sworn statements of production in excess of previous quarter was four. Besides the Western Tin Plate Works above named the Chicago Stamping Company of Chicago, Ill.; the Meurer Bros. Company of Brooklyn, N. Y., and the Philadelphia Tin Plate Company of Philadelphia were engaged during the quarter in erecting the necessary machinery for coating the plates.

Black Plate Production.—The production of black plate in the United States during the quarter was 19,679,910 pounds, of which 17,197,664 pounds, or nearly 90 per cent., belonged to the class weighing lighter than 63 pounds per 100 square feet. The production of the previous quarter was 11,355,368 pounds, of which 8,147,092 pounds, or about 72 per cent., was of the lighter class. The production of American black plates of the class weighing lighter than 63 pounds per 100 square feet was 2,989 472 pounds in excess of that of any previous quarter since the law became operative. Seventeen rolling mills made sworn returns of production, against 16 for the preceding quarter.

Consumption of American Plates.—Of the 39 firms making sworn returns of the manufacture of commercial tin and terne plates 21 used wholly American plates, with an output of 12,576,443 pounds; 12 used both American and foreign plates, with an output of 10,174,755 pounds, of which 3,331,226 pounds, or about 33 per cent.. was made from sheets rolled in the United States; six used wholly foreign plates, with an output of 4,600,043 pounds. Sixteen stamping or other manufacturing companies that use American sheet iron and steel in the manufacture of articles and wares tinned or terne plated submitted sworn statements of production, as against 18 during the previous quarter. The aggregate consumption of American plates in the various forms of manufacture was 17,152,376 pounds, which was equal to about 90 per cent. of the entire production of such plates during the quarter.

The following is a condensed comparative statement of the manufacture of tin and terne plates proper during the fiscal years ended June 30, 1892 and 1893, and the six months ended December 31, 1893:

Period of manufacture.	Amount made from— American black plate.	Per cent. American.	Foreign black plate.	Per cent. foreign.	Total.
	Pounds.		Pounds.		Pounds.
Quarter ended September 30, 1891	785,547	95.00	41,375	5.09	826,922
December 31, 1891	1,200,661	85.16	209,160	14.84	1,409,821
March 31, 1892	2,132,682	66.44	1,077,143	33 56	3,209,225
June 30, 1892	5,178,563	63.14	3,022,488	36.86	8,200,757
Totals	9,296,553	68.12	4,350,166	31.88	13,646,719
From September 30, 1892, to June 30, 1893	43,599,724	43.68	56,219,470	56.32	99,818,202
Quarter ended September 30, 1893	8,794,027	32.46	18,351,453	67.60	27,145,489
December 31, 1893	15,907,669	58.16	11,443,572	41.84	27,357,241
Totals for year 1893	54,337,889	.....	69,268,818	.....	123,606,707

The amount of American sheet iron and steel made into articles and wares tinned or terne plated during the same period was as follows:

	Pounds.
From July 1, 1891, to June 30, 1892, total	5,620,867
From July 1, 1892, to June 30, 1893, total	8,802,681
Quarter ended September 30, 1893	1,052,813
Quarter ended December 31, 1893	1,244,707
Total calendar year 1893	7,350,306

The amount of American black plates used in the aggregate manufactures during the period from July 1, 1891, to December 31, 1893, was:

Quarter ended—	Pounds.
September 30, 1891	1,914,764
December 31, 1891	2,159,991
March 31, 1892	3,620,343
June 30, 1892	6,822,322
September 30, 1892	7,197,014
December 31, 1892	10,516,412
March 31, 1893	14,102,299
June 30, 1893	20,586,680
September 30, 1893	9,846,840
December 31, 1893	17,152,376

A very instructive statement has been compiled, showing the rapid development of the production of sheet steel or black plates. The table below proves how rapidly American manufacture increased the output of plates lighter than 63 pounds per 100 square feet. It will be noted that while in the earlier periods the heavier plate represented by far the larger percentage, the quantity of light plates rose to its maximum, even during the panic period of the fourth quarter of last year.

Statement by Quarters of Fine Sheet Steel, or Black Plates, Produced in the United States from July 1, 1891, to December 31, 1893.

Periods.	Lighter than 63 pounds per 100 sq. feet.	63 pounds per 100 sq. feet and heavier.	Total.
Quarter ending—	Pounds.	Pounds.	Pounds.
Sept. 30, 1891	489,107	3,016,006	3,505,113
Dec. 31, 1891	679,584	4,593,416	5,273,000
March 31, 1892	1,696,595	4,909,370	6,605,965
June 30, 1892	4,761,641	6,067,537	10,289,178
Totals	7,626,927	18,586,329	26,213,256
Quarter ending—			
Sept. 30, 1892	4,821,180	4,202,277	9,023,457
Dec. 31, 1892	8,575,541	5,444,675	14,020,216
March 31, 1893	13,287,507	6,361,848	19,649,355
June 30, 1893	14,208,192	6,780,321	20,988,513
Totals	40,892,420	22,789,121	63,681,541
Quarter ending—			
Sept. 30, 1893	8,147,092	3,208,276	11,355,368
Dec. 31, 1893	17,197,664	2,482,246	19,679,910
Totals	25,344,756	5,690,522	31,035,278

Imports and Exports.—The quantity of tin plates and terne plates imported and entered for immediate consumption and of such as were imported on and after July 1, 1891, and were withdrawn from warehouse for consumption during the quarter ended December 31, 1893, was:

Imports.	Lighter than 63 pounds per 100 sq. ft.	63 pounds per 100 sq. ft. and heavier.	Total.
	Pounds.	Pounds	Pounds.
Tin plates	72,612,106	1,337,023	73,949,929
Terne plates	9,775,513	120,941	9,896,454
Totals	82,388,419	1,457,964	83,846,383

The quantity of tin plates and terne plates on which duties were paid and which were used in the manufacture of articles exported with benefit of drawback during the quarter was:

Exports.	Lighter than 63 pounds per 100 sq. ft.	63 pounds per 100 sq. ft. and heavier.	Total.
	Pounds.	Pounds	Pounds
Tin plates	32,663,671	86,540	32,750,211
Terne plates	4,423	.....	4,423
Totals	32,668,094	86,540	32,754,634

FLASHINGS.

Auld & Conger, Cleveland, Ohio, are sending out to the trade and to architects a card bearing a *fac simile* of the official ribbon which was evidence of a premium awarded to Auld & Conger by the World's Columbian Exposition for their Bangor roofing slate. The ribbon *fac-simile* is mounted on a heavy cardboard, on the reverse of which is a table giving the number of slate in any number of squares from ½ up to 60 squares. In connection with this table attention is also directed to the Mammoth Vein sea green slate and Bangor Union slate. In sending this advertisement to the trade, and more especially to architects, it is the desire of Messrs. Auld & Conger to persuade them to specify particular brands of slate for roofing contracts. It is well known that the practice of specifying tin plate brands is extensively carried out, and it is now suggested that the same plan might be followed to advantage in roofing slate. It is pointed out that to merely specify No. 1 roofing slate is altogether too indefinite, and it could be legally filled by the product from a hundred quarries, no two of which would be of equal value.

The strike of slaters in the Bangor district, Pennsylvania, mentioned last week, is practically over. Most of the men have returned to work. There has been no increase in wages.

The St. Paul Roofing, Cornice & Ornamental Company filed articles of incorporation with the Secretary of State, April 2, with a capital stock of $100,000. The incorporators are P. A. de Launirs, C. D. Pruden, A. K. Pruden, J. Seraen and H. Pruden.

George A. Ohl & Co., Newark, N. J., announce to cornice makers, sheet metal workers and the trade in general that they have executed a contract making them the sole manufacturers of the Vulcan Company's tools and machines. In their circular note they refer to the fact that heretofore the tools of this company have been restricted to the use of the members of the Vulcan Company, but now, in conformity with the contract mentioned, George A. Ohl & Co. are offering them to the trade.

The Illinois Roofing & Supply Company, 203 Lake street, Chicago, have just issued a 20-page catalogue of some specialties. Designs are shown of Imperial pressed steel brick, patent rock face brick and stone siding, corner trimmings of rock face and plain brick, continuous rock face stone for belt courses and window trimmings, &c. The designs illustrated are of a varied character, changes being made in details for the purpose of securing harmony with other details of building construction. Illustrations are given of buildings sided with the various materials, some with plain and others with ornamental cornice and side trimmings, &c. Instructions are printed how to lay pressed steel brick and put in window frames and doors. It is a most interesting catalogue on this subject.

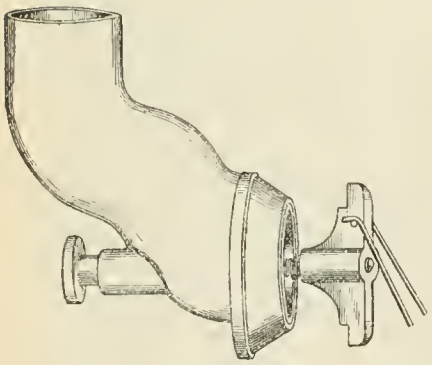
The Globe Ventilator Company, Troy, N. Y., report that they have recently placed three large sized ventilators on the new State Armory at Geneva, N. Y.

The Knisely & Yeldham Roofing Company, 68-74 West Monroe street, Chicago, are doing the galvanized iron cornice work on the building of Edward Ellis, 155-157 Madison street.

PLUMBING and GAS FITTING.

Closet Repair Coupling.

The accompanying illustration is of a coupling for connecting the water supply to an earthen closet on which the supply horn has become broken or damaged by settling of floor, jarring, or by accident. It has also been adopted by manufacturers of closets and used on new goods instead of the regular earthen supply horn. The coupling has been invented and patented by J. H. Savill, and placed on the market by Savill, Walls & Co., of 1229–31 Budden street, Philadelphia. It consists of four brass pieces, a supply arm with a tapering nozzle, over which fits a tapering rubber washer ; a screwed connecting bar, the upper end of which is ground to make a seat in the boss or lug cast in the supply arm, and a cross bar, having a wire spring attached. In use the cross bar is removed and inserted in the water way or flushing rim of the closet, the spring holding it firmly. The supply arm is then placed in the position it



Closet Repair Coupling.

is to occupy over the supply hole, and the screwed connecting bar passed through the supply arm and screwed into the cross bar until the rubber washer on the nozzle expands and makes a firm yet flexible joint. The head of the screw bar is ground in such a way as to insure a perfectly tight joint, even if the cross bar resting on the round of the flushing rim forces the screwed bar into a position out of direct line. The makers state that the coupling does not in any way interfere with the flush, but on the other hand tends to aid its right and left distribution. The coupling is made in two styles, bent, as in cut, and straight and to suit lead and iron pipe. The diameter of the bore is 1¼ inches.

James Meath, Samuel Dickson and Hugh McDonald, the Plumbers' Examining Board of Detroit, Mich., have been receiving applicants for certificates from master plumbers and journeymen, the journeymen being divided into two classes. The examination for a first class journeyman's certificate is nearly as rigid as that for master's certificate. All applicants are required to answer at least 60 per cent. of the questions. Those who fail are allowed to try again at any subsequent Friday evening on which an examination is held.

Plumbing Regulations of Memphis, Tenn.

Be it ordained by the Legislative Council of the City of Memphis that all plumbing work within the city shall be done and maintained under the following rules and regulations, divided into articles, viz.:

Article 1. No person shall proceed with any portion of drainage or sewerage, or alter old or new work, until they have filed at the office of the City Engineer a notice of the work to be performed.

Article 2. Such notice shall consist of a clear description of the work to be performed and be accompanied with a plan in duplicate, showing the different connections and locations of the different features, from the outlet at the main sewer to the termination above the roof.

Plans to be approved or rejected with the least possible delay within 24 hours—holidays and Sundays excepted—after date of filing.

Article 3. All plans must be legally drawn in ink on white paper. One vertical section in duplicate of plumbing arrangement will be sufficient if it can be made to show all the work ; if not, two or more drawings shall be furnished. Size of paper, 8½ x 12½ inches.

Article 4. No work shall be commenced until the plans are approved by the City Plumbing Inspector.

Article 5. After a plan has been approved, no alterations of the same will be allowed except on a written application.

Article 6. The City Plumbing Inspector must be notified in writing whenever any work is ready for inspection, and all work must be left uncovered and convenient for examination until inspected and approved by the City Plumbing Inspector, who will inspect the work within two working hours after he has set for inspection, provided a written notice was filed on the day previous, and he will issue certificate of inspection and approval at the time of final inspection.

Article 7. All plumbing work in new buildings and new work in old buildings, together with any old work which may be allowed to remain, shall be treated by the plumber, in the presence of the City Plumbing Inspector, with water or air, as the plumber may select. The tests to be as follows :

Water test to be applied from the roof of building to the end of iron pipe where connection is made with stone pipe. Air test, 15 pounds for 30 feet and under, and 20 pounds pressure for over 30 feet, vertical pipe. The work tested to stand the water test without any leakage, or stand the air test without any diminution of pressure on the gauge for ten minutes.

Note.—Any old work must be tested with water or air and found tight before it be allowed to remain and be incorporated with new work. This rule not to apply to additions to old work that is in good condition.

Article 8. Every building shall be separately and independently connected with the city sewers. Each tenement to be considered a separate building. All lines of 6-inch pipe in private property shall have not less than 10 feet of 4-inch pipe to closet or slop sink. This is for places where a number of small houses are on one lot.

Article 9. All pipes receiving the discharge from water closets, from 14 inches below the surface of the ground, except in roadways, where 2 feet will be required, to 6 inches above the eaves of the roof, must be of cast iron, 4 inches inside diameter, put away (20 feet minimum distance) from all windows and left open on top. All branches or extensions of sewer connections, whatever use they may serve, if more than 7 feet in length, must be ventilated by same size cast iron pipe to 6 inches above the eaves of the roof.

Article 10. All horizontal 4-inch cast iron pipe used for soil or waste, below or above ground, or placed on wall in cellars, shall have fittings and 4-inch brass trap screws on ends and on the main line, and not over 25 feet apart. All 2-inch cast iron waste pipe shall have Y-branches and 2 inch brass trap screws, as best located to clean out same.

Article 11. All stone pipe shall be of good quality vitrified salt glazed sewer pipe, free from blisters, thoroughly glazed and burned, straight, and of uniform texture, with good bells of sufficient size to insure proper jointing. All connections shall be made with Y-branches and all changes in direction with curved pipe or Y-branches.

Cast Iron Pipe.—All connections shall be made with Y-fittings. Sanitary tees can only be used on vertical pipes. No waste pipe shall be topped into soil pipe or trap of any other fixture, but shall have separate fittings (side outlet Y on sanitary T considered separate fittings).

No double hubs or sleeves to be used on vertical or horizontal lines of iron pipes used for the discharge of waste or liquid, except for connections.

Article 12. All joints of cast iron with lead pipes shall be made with a brass Raymond or other approved make of ferrule of same size as lead pipe set into the hub of the iron pipe and calked with lead, and to be attached to the lead pipe by a wiped solder joint.

All joints in lead pipes must be made with solder and wiped, if possible. All joints in cast iron to be made with packed oakum and molten lead, well calked, the lead to be at least 1¼ inches deep and joint made water and air tight. The joints to be left as calked until tested. All joints in earthen pipes shall be made with good hydraulic cement proportioned one to one with clean, sharp sand, gasket of oakum to be used on the end of each joint to keep the cement from entering the pipe. Care must be taken that the inside of the pipe is perfectly cleaned out before a connection is made with the house, the ends of all pipes to be kept closed during construction.

Article 13. All waste pipes, when less than 2 inches diameter, shall be of lead.

No pipe allowed less than 1¼ inches inside diameter. All waste and vent pipes 2 inches inside diameter and over the pipe and fittings shall be cast iron. Galvanized or rustless wrought iron pipe may be used for vent pipes. No waste pipe from refrigerator or other receptacle in which food or provisions are stored shall be connected with a drain, soil or other waste pipe, but must be separated therefrom, emptying into an open sink furnished with a trap.

All waste pipes from interior plumbing, exclusive of water closets and urinals, when less than 7 feet in length, can be discharged into an open trapped yard sink. If over 7 feet in length, ventilated pipe must be carried 6 inches above the eaves of the roof. If five or more fixtures are attached, waste pipe shall be 2 inches inside diameter or over.

Only one fixture allowed on 1¼ inch waste pipe, vent pipe to be same size as waste pipe.

Article 14. In all house connections the line of pipe as to grade and direction must be as straight as possible and located on same lot as house. For one line of pipe ditch to be not less than 18 inches wide ; for two lines, ditches must be 30 inches wide.

Grade to be not less than 1 to 50. In all ditches where the bottom is unsafe from any cause, as made ground, old wells and vaults filled up, &c., the grade of pipe must be made safe either by concreting, planking or the use of iron pipe, &c. All ditches must be properly graded, bells cut out and made clean of loose dirt.

If water pipe is placed in a sewer ditch it must be placed well to one side and above the sewer pipe and must be of extra strong lead. Iron water pipes must be placed in separate ditches.

Article 15. Any line of pipe connected with the city sewers if within 4 feet distance of brick wall of dwelling or any

building containing a cellar or basement or within 6 feet in solid clay, or 10 feet in made ground, of well or cistern, shall be of cast iron pipe. Stone pipe can be used under houses only where there are no cellars, and it is not inclosed, but rests on piers In passing through cellar or basement, pipe shall be attached to walls where possible.

ARTICLE 16. All water closets and separate fixtures must be trapped as close as possible, not more than 10 inches from weather ceil to floor. In no case shall cast iron hopper be leaded into pipe or trap, but shall be fastened down with brass screws; on cement or brick floors, iron hoppers shall be fastened on a flange with brass screws or set screw bolts. All earthenware hoppers and washout closets shall be fastened to lead or brass flange soldered to ferrule and fastened by brass screws or bolts. No fixtures allowed in cellars or basements where there is danger of back water from the city sewers.

ARTICLE 17. Cast iron traps with hand holes shall not be used. No bell trap, running trap or any trap depending for its seal on a movable part shall be used. No water closet shall be used which has an unventilated space of more than 100 cubic inches between two water seals, or which has such unventilated space of any capacity in which any part of the mechanism moves or the walls of which are not flushed at all points at each use of the closet. This includes the pan, Defiance and all other closets of similar construction.

ARTICLE 18. All S and P lead traps for small fixtures which are back vented from the crown of trap shall be of the same size as the water pipe. All 2-inch cast iron traps shall have trap screws.

ARTICLE 19 All kitchen sinks for hotels, restaurants, boarding houses, &c, shall have some standard grease trap attached. Grease traps are also recommended for use in private residences.

All yard slop sinks shall not be less than 2½ feet square, the frame filled in with broken stone or hard brick concrete tamped until solid and finished smooth with good cement; size of timbers 2½ x 12. See plan at engineer's office.

Catch basins, if allowed, to be located and built according to plans on file at the city engineer's office.

ARTICLE 20. In cleaning out house connections all broken or damaged pipe must be replaced with sound pipe, well oakumed and cemented, and must be inspected before ditch is filled in.

ARTICLE 21. All ventilation pipes on outside walls in public or private alleys shall come through the wall not less than 6 feet above the grade of said alley for protection from damage by passing vehicles. Before ventilation pipe is attached to the wall of building on adjacent property the consent of the owner of said property must be obtained.

ARTICLE 22. All 4-inch soil and ventilation pipe and fittings on the inside and outside of dwellings and buildings shall be cast iron pipe. No soil or ventilation pipe shall rest on stone pipe, but on cast iron bent or Y firmly supported and with a short piece of cast iron pipe 2 feet long attached horizontally to which the stone pipe connects. Vent pipes to yard closets shall not be less than 8 feet above the ground.

ARTICLE 23. All waste pipes must be trapped at each separate fixture, and as close as possible to fixture. Laundry tubs of not more than three parts to be considered as one fixture.

ARTICLE 24. All traps if found necessary to prevent syphonage or back pressure must be furnished with a vent pipe from crown of trap.

The vent pipe from a water closet trap must be at least 2 inches inside diameter. Where the back vent pipes from more than four water closet traps (other fixtures are included) are combined, or the vent pipe from four water closet traps is over 30 feet in length, the size of the vent pipe must be increased to 3 inches inside diameter, and must be carried 6 inches above the eaves of the roof, or may be run into soil pipe 5 feet above the highest fixture. In buildings over six stories high the size of vent pipe must be same as soil pipe, and must be carried 6 inches above the eaves of the roof. Other vent pipes from traps must be as large as the respective waste pipes, but where five or more are combined, or the vent pipe from one trap is over 30 feet in length, the size of vent pipe must be increased to 2 inches inside diameter and carried 6 inches above the eaves of the roof, or may be run into soil pipe 5 feet above the highest fixture. Where two or more fixtures are attached to a 2-inch waste pipe, all traps shall be back vented.

All washouts or other closets that have the trap attached above the floor, the trap must be back vented, syphon closet excepted. No running traps or back water valves or any manner of obstruction to the full flow of air through the whole course of pipe will be allowed.

ARTICLE 25. All water closets and urinals hereafter constructed in any building within the city of Memphis shall be placed in a room with not less than 12 square feet of floor space thoroughly ventilated. This room in dwellings shall not communicate directly by means of door or opening whatever with any sleeping room or sitting room or apartment which is occupied by any human being during as many as two out of 24 consecutive hours. The room shall have at least one window (2½ x 6 feet) to the open air, with upper and lower movable glass sash hung on weights, or window of same area on pivots (2½ x 3 feet).

ARTICLE 26. The discharge from hydraulic elevators must first enter a drum of sufficient size to hold the entire discharge, from which the water will pass to the sewer without pressure. The drum must be thoroughly trapped and ventilated.

ARTICLE 27. Steam or hot water from any source must first enter a receiving basin or condenser properly trapped and ventilated. The size of the basin may be reduced by the use of twin or double valve, allowing the escape of sufficient cold water at the same time with the steam or hot water to reduce the temperature.

ARTICLE 28. All water closets shall be located so as to have not less than 15 feet sewer connections to the city main and not less than 5 feet inside of property line.

ARTICLE 29 No trap vent shall be used as a waste or soil pipe.

ARTICLE 30. Overflow pipes from fixtures must be connected on inlet side of trap.

ARTICLE 31. All alterations and additions on old sewer, soil or waste pipes shall be made in accordance with these rules.

SECTION 2. Be it further ordained, that the foregoing rules and regulations be, and they are hereby, substituted in lieu and stead of the plumbing rules and regulations provided for in section 258 F, subsection 2, sub division G, and the said subdivision of said sub-section is hereby repealed.

TRAPS AND VENTS.

BOLGER & REGAN, plumbers and hardware dealers at Gloucester, Mass., were visited by fire April 6, and though their building and stock was not entirely destroyed, much damage was sustained.

JAMES E. MURPHY, a well-known plumber of Springfield, Mass., has opened a plumbing and tinning establishment at 138 Dwight street.

CHARLES SCOTT is going into the tin and plumbing business at Benson, Vt.

WM. MATHEWS & SONS have formed a partnership to conduct the plumbing and tinning business at Lebanon, Pa.

THE FIRM of G. W. Hazel & Co. have dissolved by mutual consent, and the G. W. Hazel Company have been incorporated to continue the stove, furnace, plumbing and tinning business at the old stand, 11 and 13 Church street, New Haven, Conn. The company have a capital of $15,000, which is held by Wm. H. Hazel, Julietta D. Hazel and Francea D. Hazel.

THE ARTICLES incorporating the Rock Island Heating & Plumbing Company have been filed in the recorder's office at Rock Island, Ill. The capital stock is $10,000, and the incorporators are T. F. Burke, John Joers and Ernest Wagner.

GEORGE LEONARD is going to move his plumbing shop to the corner of Second and Joliet streets, La Salle, Ill.

WILLIAM ROSE is about to open a plumbing shop at 3620 Jacob street, Wheeling, W. Va.

WILLIAMS & Co., 90 Ann street, New York, make a specialty of soapstone for every purpose, griddles, foot warmers and open stoves, and have a large trade in laundry tubs and sinks and wainscoting with the plumbers throughout the country.

DU BOIS & DARROW are a new house with an office and sample room at 61 Gold street, New York. They will make a specialty of plumbers', steam and gas fitters' materials.

SECRETARY MCNAB of Paterson, N. J., informs us that the Master Plumbers of Paterson and Passaic are now members of the National Association.

WE ARE INDEBTED to Charles Millar & Sons, Utica, N. Y., for a copy of their handsome catalogue for the year 1894. This volume is a substantial publication, bound in stiff boards and contains over 230 pages. The frontispiece is a handsome engraved portrait of Charles Millar, who was born in 1808 and died in 1890. In an introductory notice to the trade they state that they are largely interested in and are the exclusive selling agents for the Utica Pipe Foundry Company and are prepared to furnish all material for the construction of new water works or the extension and improvement of old ones. They also refer to the excellence of their lead pipe, as well as their solder, tin pipe and tubing. They act as agents for various manufacturers of patented and staple goods and have large warehouses with full stocks. The following condensed index indicates the extensive line of goods made and handled by this well-known supply house: Wrought iron pipe and fittings, iron cocks, iron body valves, steam brass work, engineers' supplies, plumbers' brass work, plumbers' copper work, lead traps, plumbers' earthenware, marble slabs, water closet apparatus, plumbers' iron work, pumps, cast iron soil pipe and fittings, vitrified sewer pipe, corrugated conductor pipe, ventilating or leader pipe, hose, belting and packing, steam heating, gas fixtures and fittings, tools, lead pipe and metals, cast iron water pipe and fittings. All of the goods are illustrated, descriptive particulars being given where necessary, and in all cases full lists of sizes and prices. A very attractive feature of the book is the light green tinted paper that is used.

THE EDITION of the illustrated catalogue of the Haydenville Mfg. Company, 73 Beekman street, New York, issued this year, is probably the largest ever issued by a plumbers' supply house. Between 25,000 and 30,000 copies have been put in circulation.

SANDS & HOULE opened their new plumbing establishment and hardware store in the Goodwin Block, on Main street, Biddeford, Maine, last Saturday.

B. & H. H. SOMMER are arranging a fine line of plumbers' marble and sanitary ware at their new showrooms, 50 Cliff street, New York. They import Italian marble and English water closets, lavatories, Yorkshire laundry tubs and white porcelain sinks, tubs and lavatories and iron enameled roll rim baths. Pink Knoxville and Tennessee marble, as marble for floors and walls, in addition to plumbers' slabs, are a specialty.

BENTON R. DIBBLE AND CLINTON HURLBURT have opened a plumbing establishment in Winsted, Conn.

ROBERTS & SIMMONS is a new plumbing firm just opened for business in the Eitlegeorge row, 18 La Salle street, Aurora, Ill.

W. H. HITCHCOCK has added a stock of tinware to his stove and plumbing business on Central street, Palmer, Mass.

STOVE TRADE NOTES.

The New England Stove Trade.

Trade in New England is barely holding its own. As was expected, the first quarter of 1894 compares unfavorably with the same period of the previous year, although the net falling off is not so great as was feared. Most of the Eastern manufacturers are busy preparing new goods, but these will not be made in any great quantity until the season is further advanced and the probable demand can be more accurately gauged. Jobbers report a fair amount of business, particularly in gasoline stoves and refrigerators. The former are selling in much larger quantities in this territory than ever before, but the demand for the latter is not so great as last season. Sample orders so far constitute the bulk of the trade. The repair trade is between seasons and a light business is doing in this line. Reports of collections are rather conflicting, but generally speaking there is no improvement and possibly a slight decrease; however, hand to mouth buying naturally favors better collections, as small bills are paid more promptly than large ones. The furnace trade is dull and the prospects are rather uncertain, although a fair demand is expected.

The outlook for building in this vicinity as regards smaller houses is not particularly promising. Speculative builders who in former years have erected a large number of low cost houses and disposed of them to parties of moderate means, accepting a few hundreds of dollars in cash and taking mortgages for the balance, find that owing to the hard times it is almost impossible to make sales to this class of people, and the fact that a number of those disposed of last season have come back on their hands through the inability of the purchaser to continue his payments is resulting in more conservatism among the builders. Larger work, however, such as school houses and other public buildings, bids fair to be active during the spring and summer. Many towns and cities throughout New England are making liberal appropriations for public works, and from this source the steam and hot water men expect to derive considerable business.

Taking the several branches of the trade together, and considering the general state of things, there is really little room for complaint. Of course, business is unsatisfactory, but that is true of almost every line, and it does not appear that the New England stove trade is feeling more than its natural share of the existing depression.

New Trade-Mark.

The Western Stove Mfg. Company, St. Louis, have adopted a new trade-mark, which we illustrate herewith. The center of the trade mark represents an apple with a short stem and leaves attached and surrounded by rays. The name and address of the firm, with an indication of the line of goods manufactured, appears on the side of the

Trade-Mark of the Western Stove Mfg. Company.

apple. The design is neat and attractive, and will doubtless meet the general approval of the trade.

St. Louis Stove Trade.

The stove trade at this time of the year is at about its lowest ebb, and in ordinarily good times it is difficult to market stoves, while now it is particularly so. Manufacturers, however, are living in hopes of better times, so much so that at least 80 per cent. of the producing capacity of the stove trade in this city is at present employed. Only one foundry is closed down, and that the smallest of the four located here. The other three are running nearly, if not quite, full. With the enterprise which characterizes the stove trade at large, the local foundries are at work on new goods, which will make their appearance in the course of the next two months. Reports from their traveling men indicate that the stock of stoves in retailers' hands was never before so light, and with any kind of improvement in the general commercial situation, no matter how slight, the stove trade will be quick to respond. It is pretty generally agreed that the sales of stoves during the year 1893 were from 25 per cent. to 30 per cent. less than the year immediately preceding, so that it seems reasonable to assume that those who postponed buying last year will be forced to become purchasers this year, even if unwilling ones. Many stoves were used last year which ordinarily would have been dispensed with, and they cannot possibly be made to do service again. It is a little too early to make any predictions regarding the volume of this year's business, but it is safe to assume that it will show material improvement in comparison with last year.

As regards gasoline stoves there is not much cause for complaint. The largest local manufacturer, and the largest perhaps in the country, informs us that their business at this writing is very close to last year, and the indications for a continuance of this activity are encouraging.

Albany Gossip.

Our Albany correspondent, writing early in the week, says: A visit to the manufacturing plant of the Perry Stove Company shows trade in this section to be reviving, and indicates the increase of hopeful features. The plant started up, after inventory and repairs, on February 5 and has been in operation ever since. The force of molders is the same as the number employed at the time when the concern shut down. The company have been largely engaged in manufacturing their popular lines of oil and lamp stoves, to which they have added one entirely new size, the Royal F, a four-burner stove, full nickeled, with large permanent extension top, having four full sized 8-inch boiler holes. The stove has met with great popularity. The Perry line of Royal lamp stoves has been greatly improved by the addition of a very convenient lighting device and the enlargement of the smaller size. This line is now furnished in polished nickel and is a very complete and serviceable assortment of oil goods. The Jockey is a new addition to their line of lamp goods, and is of medium price.

The Shoo Fly is also a new low priced line. The company are making two new lines of hot plate gas stoves — the Argand and Fire Fly. These are neatly finished in nickel and plain iron, are simple in construction and powerful in operation, possessing many special and useful features As a specialty the company have brought out a double oil stove mounted on polished nickel or a japanned base, with either two or four hole removable extension top. They have also made new and improved extension tops and furniture for their oil and lamp stove lines. The superintendent of the company, R. Z. Liddle, says that while their plant has been very busy with spring goods the general trade has not been up to the standard, but they believe they have had a large percentage of the sales in these lines and hope for improved

conditions. They are at work on some special improvements in ranges and parlor goods, which they will bring out later, and which, they believe, will meet with general favor.

Mason & Davis Company,

72-76 Lake street, Chicago, have just issued their catalogue for the season of 1894. The products of this company comprise wrought steel ranges, charcoal broilers, laundry stoves, gas ranges and hot air furnaces, all of which are put on the market under the brand "M. & D." The catalogue now being distributed is the largest thus far issued by the company. It consists of 76 pages, octavo, illustrated with engravings of more than usual excellence and bound with an olive colored paper cover. The first part of the catalogue deals with wrought steel ranges, adapted to the use of any kind of fuel. The ranges shown cover a great variety of styles, such as 4-hole and 6-hole family ranges with square tops and either high or low warming closets; the same with reservoirs at the side or with a galvanized iron tank on brackets; others with handsome sheet iron canopies and with broilers on brackets at the side; large ranges for restaurants and hotels, running from six holes up to as many as may be desired. The gas ranges are all built in cabinet style, the smaller ones having a single oven and four cooking holes, while larger ones are made with double oven and six holes. Several kinds of combination ranges are shown, in which half the range is for use with coal or wood, while the other half is equipped for gas. The M. & D. gas ranges have a number of special features, such as an elevated broiler, a swinging oven burner which can be drawn out for lighting, and water heaters which can be used at the same time for cooking purposes. The water heater is composed of seamless brass tubes, which heat quickly and are economical in the use of gas. The combination ranges are so built that water can be heated either on the gas range or the coal range side, either being always ready for use. These ranges have grown steadily in favor since they were first brought out as an experiment to see whether there would be a sufficient trade in them to warrant their regular manufacture. A charcoal boiler is a separate article of manufacture. Laundry stoves of several styles are shown. The M. & D. furnace is intended for either hard or soft coal, is made with a dome of steel plate, and is fitted with a circular cast iron radiating section around the fire pot, which acts as a return flue and radiates the heat that remains after leaving the body of the furnace. It is made in four sizes. The catalogue closes with several pages of illustrations of repairs for all kinds of M. & D. ranges.

ODD PLATES.

The Baxter Stove Company of Mansfield, Ohio, state that the fire which on April 5 destroyed a portion of their storage warehouse, causing considerable damage to the building and to their stock of Banner coal and wood stoves, did not affect the operating department, nor did the fire reach their stock of Monarch vapor and gas stoves. No delay, therefore, will be caused in the filling of orders for these goods, as the company will continue running without intermission, and orders placed with them for either Banner or Monarch stoves will be promptly shipped. The fire was caused by an explosion in the japanning department, but the loss is fully covered by insurance. In a circular letter which the company have issued under recent date, they say they are prepared to offer a large discount on such Banner cooks and heaters as were damaged by water and on which a large force of men is at work cleaning and restoring them to a marketable condition.

Eugene Munsell & Co., 218 Water street, New York, are remodeling the back part of their premises used for general office purposes. The entire portion heretofore used for clerical work has been torn out and replaced with narrow ash boards, running up two stories and covered with a glass roof. The wood work will be finished in natural color. This rearrangement will insure plenty of light and good ventilation.

The Marion Stove Company of Marion, Ind., invite the attention of dealers to their Retort self feeding stove, adapted for using any kind of soft coal as a fuel. The heater is made in two sizes, Nos. 16 and 18, embodies the modern features and is ornamented in a neat and attractive manner.

Barstow Stove Company, corner of Beekman and Water streets, New York, are the special agents for Jewel gasoline stoves made by George M. Clark & Co., Chicago, Ill. The line covers a large assortment of process and cabinet ranges, step, medium and junior medium stoves, junior safety and Jewel-Acme medium and safety stoves, Jewel ranges and picnic stoves, &c.

The Simonds Mfg. Company, 50 Cliff street, New York, have made their sample room very attractive. The walls are decorated with their register faces in various designs, white and black enameled and electro plated in brass, copper and oxidized, artistically arranged to secure good effect. Their line of hot air furnaces are finished in white and gilt, and their ranges with a deep black polish make a very pleasing contrast. A new catalogue of their goods soon to be ready for distribution is said to be very handsome, and may well be preserved as a souvenir.

Eugene Munsell & Co , 218 Water street, New York, have issued an illustrated price-list of gas stoves and ranges for this season's trade. Among the goods referred to is a line of Favorite Manhattan gas ranges, with two, three and four top burners, and with or without hot water heater. They also direct attention to an improved method of mounting kitchen boilers for circulating hot water, in connection with combination coal and gas ranges, so located as to economize kitchen space. It is known as the Graves Ronalds boiler, and in itself resembles the usual upright pattern. It is supported by a cast iron shelf about 2 feet above the top of the range at either the right or left hand corner, projecting about one-third the diameter of the boiler beyond the range. From the floor to the top of the boiler is from 76 to 80 inches, depending on capacities of 18, 24, 30, 34 and 40 gallons. Hot water is drawn from a faucet placed at the lower water back connection.

W. M. Crane & Co , 838 Broadway, New York, have enlarged their capacity for doing business by adding an annex in the rear of their present quarters in size 25 x 30 feet, which they hope to occupy before May 1.

George Starrett, 227 and 229 Water street, New York, has been appointed Eastern agent for the ranges manufactured by the Electric Oil Stove Company, Homer, Mich. These ranges are made in both two and four hole sizes, in a number of styles with and without open work, warming attachments at back and sides. The top is of cast iron, with black enameled and ornamented steel frames, fitted with casters. A long horizontal round tank, holding 1 or 2 gallons of kerosene oil, according to size, feeds the lamps, which with the tank are supported upon a sliding shelf, which can be drawn forward for filling or trimming. The central draft brass burners are supplied with 10-inch round extra heavy wicks, giving an intense heat with no perceptible odor. The covers or lids are 8 inches in diameter, with 4 inch removable center lids, convenient for heating cups, teapots and other small utensils. The lamps have mica fronts, and in the tank is a float to indicate the volume of oil.

Henry Gleason, 106 Beekman street, New York, has just returned from a tour of the Western stove foundries, covering a period of about three weeks. The principal object of the trip was to inform himself concerning what is latest and best in independent gas stove connections, embracing cocks, pipes, nipples, caps, air mixers, &c. He has recently taken the selling agency of Simpson Fry Mfg. Company of Brooklyn, N. Y. This is in addition to the following lines, for which he has long been agent: New Jersey Lamp & Bronze Works, stove urns and bronze figures; Trent Tile Company, stove tiles, and Matthews Mfg. Company, stove knobs, hinge pins, &c.

J. H. Cort & Son, 220 and 222 Water street, New York, manufacturers of and dealers in cooking and heating apparatus, are about to vacate the premises so long occupied by them at the corner of Water and Beekman streets, and move to their factory in Brooklyn, corner Adams and Water streets. They will make a specialty hereafter of manufacturing exclusively such goods as gas ranges and oil heaters.

The Tracy Gas Stove & Furnace Company of East St. Louis, Ill., have recently been incorporated, with a capital of $50,000. The incorporators are: L. J. Tracy, Theodore Hebus and Charles Elam.

The Bain Stove Company, Charleston, Ill., was recently sold to the Charleston Building & Loan Association for $13,000. It is intimated that people in Charleston will operate the works.

E. B. Colby & Co., 237 Water street, New York, have been appointed Eastern agents for the Cable and Cable, Jr., oil stoves. These are made in one, two and three wick styles, with cast iron oil tanks, at prices very close, they say, to those made of tin. The Junior pattern for gasoline is made in one, two and three burner styles. The feature of this construction, as stated by the agents, is that the tank must be lifted off to fill it, closing automatically as this is done. When filled it must be put properly in place, when the connection opens automatically. This prevents filling while attached to a lighted stove, as the stove will burn full 10 minutes after the tank has been removed. They are also offering as agents a full line of the Gurney refrigerators, made by the Gurney Refrigerator Company, Fond Du Lac, Wis. One

of the characteriatics of these refrigerators is the removable patented galvanized ice compartment, which can be instantly lifted out for cleaning. At the left is also a cast iron tank within the compartment, porcelain lined, for refrigerating drinking water, to be drawn at will through a faucet, the water being cooled by the proximity of the ice.

W. M. Crane & Co., 838 Broadway, New York, manufacturers of and dealers in hotel, *café* and restaurant gas appliances for cooking and heating purposes, are continually bringing out novelties in this line adapted to public or private use. They recently got up to order for D. B. Wesson, Springfield, Mass., the well-known pistol manufacturer, an elaborate laundry stove to heat six irons separately, having a capacity equal to the needs of a family of ten people. A copper boiler was placed in the center, and the entire apparatus handsomely nickeled. One of the several departments of their business is the fitting up of banks, trust and insurance companies, exchanges, &c., who provide their employees with a warm noonday meal, with gas cooking outfits. Among those put in recently in this city are the Fourth National Bank, Farmers' Loan & Trust Company and Bank of the Metropolis, some of whom provide for upward of 100 people. This company have just completed a series of experiments in connection with a gas furnace for heating an entire house. These will be offered as a substitute for coal furnaces, necessitating no alterations in flues, registers, &c.

Fletcher, Russell & Co., Limited, Thynne street, Warrington, England, favor us with a copy of their catalogue for March relating to gas heating appliances. In its general make up it resembles previous editions brought out by the company, is profusely illustrated, and clearly indicates the line of specialties manufactured. Attention is invited to their Standard high power concentric ring burners, which are suitable for furnaces and for use under vessels of large diameter. They are made separate and independent of each other, or four burners can be fastened together and used as one. Mention is also made of their triple concentric burners, 8½ inches in extreme diameter and consisting of three burners in one casting. A great deal of interesting matter relative to gas cook stoves and heaters is given, and while the catalogue is issued for circulation among the English trade, it contains many things likely to interest dealers on this side of the water.

Dispatches from Reading, Pa., are to the effect that the trouble recently referred to as existing among the mounters at the works of Orr, Painter & Co. is practically at an end. Some of the mounters have returned to work, and at the time the dispatches were sent it was thought everything would be settled in a few days. All the other departments are in full operation, and it is intimated that the Milmont plant will be running full in the not very distant future

The Gobeille Pattern Company of Cleveland, Ohio, are distributing an advertising novelty which is decidedly unique in its way. It consists of a piece of white pine 4 inches square and $\frac{5}{16}$ inch thick, planed perfectly smooth and bearing upon one side a postage stamp and the name of the addressee, while on the other side is the printed matter, which appears in colored ink. In the upper right hand corner is a *fac simile* of the company's trade-mark, and in the opposite corner are the words "Inside Information," and below them in parenthesis, "On the Square." The body of this wooden postal card is occupied with the following: "Do you know that when business starts up there will be a lot of new goods on the market and the old styles will not go? The best concerns are quietly adding to their line either entirely new or freshly decorated patterns. A word to the wise is sufficient." This is signed with the name and address of the company.

Giblin & Co. of Utica, N. Y., have issued from the press a very neat catalogue, oblong in its general shape and bound in colored paper covers, illustrating and describing the furnaces which they manufacture. These include the Standard Rival, Standard Junior, Standard Smokeless, Rival Junior and Smokeless, some of which are combination heaters. The goods are carefully illustrated and fully described, the matter being arranged in a way to prove interesting and instructive to the dealer.

The Michigan Vapor Stove Company of Grand Rapids, Mich., have issued a very pretty catalogue for 1894. Their line of stoves comprises steel frame single and individual generators, consisting of three-burner with step, two-burner with step, two and three burner square top, two and three burner high juniors, and two and three burner juniors. A peculiar feature of these stoves is their equipment with a tank which can be taken off for refilling. This enables it to be taken out of doors to be refilled, so that no gasoline whatever is exposed in the house. The burners used on the step stoves are of a special pattern, denominated jet cone burners, which divide the flame into a large number of jets, thus distributing the heat evenly over an extended surface. Full repairs are furnished for all stoves. The catalogue also treats of stove furniture in considerable detail.

The Howard Furnace Company of 210 Water street, New York, have lately completed the contract for heating the Fourth Avenue M. E. Church, corner Fourth avenue and Forty-seventh street, Brooklyn, using two of their largest size combination furnaces with hot water radiators in each of the classrooms of the Sabbath school building, also in the church audience room, together with the lecture room, ladies' parlor and pastor's study. The company have also put in a number of other combination furnaces in private dwellings and have just completed a dwelling for a prominent architect of Philadelphia. They also placed one of their combination furnaces in King's Hotel, Amityville, L. I., in the early part of the winter. They have received very flattering commendations of the same for the efficiency of the work in extreme cold weather. The company now have under contract a school house on Long Island.

A. Weiskittel & Son, Baltimore, Md., favor us with a very neat card having a gilt border and embellished with illustrations of a Fire King cabinet gas range and a Fire King table stove. The printing is in two colors, forming a pleasing contrast and giving a rather rich effect. There are illustrations of the new Fire King gas burner noticed in these columns a week or two since. In the lower left hand corner of the card is a *fac-simile* of the firm's trade-mark, while at the right appear their name and address. The opposite side of the card carries a number of reasons why gas should be used for a fuel.

S. S. Jewett & Co. have removed their office and salesroom from 38 and 40 Lake street to 2050 Grove street, Chicago, occupying for that purpose a portion of their new warehouse. Its location is at the south end of the Canal street bridge over the south branch of the Chicago River.

The Fuller Warren Company's Chicago headquarters will be removed on May 1 from 48 and 50 Lake street to 147 and 149 on the same street.

Cribben & Sexton, 75 and 77 Lake street, Chicago, will remove their office and salesroom to their new building at 50 to 53 Erie street, May 1.

Charles F. Bartlett, Tenth and Filbert streets, Philadelphia, Pa., issues a circular of liberal proportions, the object of which is to bring his name and business prominently before the mind of the dealer when in need of anything in the way of heaters, ranges and open grates. Mr. Bartlett has been engaged in the business indicated for nearly half a century, and states that his workmen are only those who have had experience in the making of goods of this kind. The circular illustrates and describes the Tobasco, a new and improved portable furnace with shaking and dumping grate, the London Café wrought steel portable range, made with single or double oven, the London Kitchener, suitable for private families or public institutions, the London Café wrought steel gas ranges, the Vesper open fire place, the Perfection gas grate and the Veteran and Bartlett furnaces. One side of the circular is devoted to a list of names and addresses of some of the people in Philadelphia and vicinity who are using Bartlett ranges and furnaces.

John D. Rise, formerly cashier of the Lebanon Trust and Safe Deposit Bank, has recently been appointed the financial manager of the Lebanon Stove Works of Lebanon, Pa. Mr. Rise took charge of the affairs connected with his new position on Monday, April 9. He was appointed to succeed J. M. Reilly, whose resignation was referred to in these columns a short time since.

Walker & Pratt Mfg. Company's foundries, at Watertown, Mass., commenced this week to run four days out of six, instead of shutting down altogether, as was contemplated.

The Wm. G. Fischer Mfg. Company of Kokomo, Ind., have brought out a new four-hole wrought range, which they have christened the No. 248 Columbian. The American shield appears on the oven door, the corner pieces are decorated with stars and stripes and an outstretched eagle surrounded with stars appears on the feed door. The manufacturers, therefore, allude to it as "the banner range of 1894." It is well made, having a drop oven door, patent drop feed door, triangular grate, gravity latch, nickeled front guard rail, high shelf, flues lined with heavy sheet asbestos protected between two sheets of steel, and the body made with round corners closely and substantially riveted. The oven is so made that it is claimed to be proof against dust, ashes, smoke or gas. This range is made for soft or hard coal, coke, wood or natural gas.

A most excellent advertising scheme has been devised by the Michigan Stove Company. They furnish to any hotel keeper a full set of dating stickers, covering every day from now until the end of the year, to be used on his register of guests. They are printed in

carmine, are very neat in appearance, give the day of the week as well as the full date, and thus cause the date to stand out prominently on the page. Each sticker is 7 inches long by ¾ inch wide, printed on perforated paper so as to be easily torn from the sheet and gummed for instant use. The sole suggestion of the Michigan Stove Company's connection with the date line is their Garland trade mark in the center, but it is of modest proportions and rather ornamental.

THE GIRARD STOVE & FOUNDRY COMPANY of Girard, Ohio, contemplate the erection of a larger building, and there is some discussion of the advisability of removing to another locality. Youngstown has hopes that in such an event the advantages of that point will not be overlooked.

THE WORKS of the Mississippi Valley Stove Company, at Fulton, Ill., have been completed, and manufacturing operations will begin very shortly. This concern is the transplanted Ohio Stove Company, formerly of Tiffin, Ohio.

Decline of the Brick Set Furnace.

BY A. W. GLESSNER.

President Excelsior Steel Furnace Company, Chicago.

A feature of the furnace business of to-day that has received a good deal of attention at the hands of the trade is the decreasing demand for the brick set furnace in favor of the portable furnace. In some sections of the East, and particularly in some of the larger cities of Ohio and Pennsylvania, the brick set furnace is still being put in in considerable numbers, but throughout the larger portion of the country at the present time, and particularly in the large and growing cities of the West and middle West the brick set furnace is becoming almost as rare as the buffalo. The brick set furnace has done a great work in its day, but the requirements of modern dwellings are such as to make it an undesirable fixture in the basement of the city dwelling of to-day.

Undoubtedly at the time when the brick set furnace first came into popularity this style of furnace was much more economical in its consumption of fuel than was the portable form of furnace, for the reason that then the improved casings and bonnets now in use had not come into use, and a large proportion of the heat generated by the portable furnace was practically lost.

Furthermore, there has come a decided change in the uses to which the modern basement is put. A large portion of the dwellings erected at the present time in towns and cities are supplied with water systems as well as plumbing and drainage systems and the pipes pass up through the basement, and in not a few cases, where brick set furnaces had been installed in houses before the introduction of water or drainage service, it was found that after the service had been introduced there was great liability of freeze ups. There should be sufficient warmth in the basement during the most severe winter weather to prevent the freezing of the pipes; and whereas a brick set furnace might, and undoubtedly would, effect a very slight saving of fuel over the portable form, this economy of fuel will be more than counterbalanced by the loss, annoyance and damage caused by a single freeze up in the course of a winter. I know of one manufacturer of furnaces who formerly made brick set furnaces in large numbers, who has not had his patterns for them in the sand for the last two years. The tendency to abandon the brick set furnace seems to be a good one, and not only does the portable furnace supply in every respect the requirements of the modern dwelling, but it does so at a considerably lower price.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

WM. G. MCLEOD of Cambridge, Mass., will erect a four-story apartment house of twelve suits of rooms, each to have a bathroom and an independent system of heating.

MAY & HARRIMAN, plumbers, were the lowest bidders for the work of equipping the water closets in the court house at Anderson, Ind. They will put in ten closets and eight urinals for $913, and make all connections with the sewer.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until May 2, for work including low pressure steam heating and mechanical ventilating apparatus for the United States Court House and Post Office building at Paris, Texas. Drawings and specifications can be had from the Supervising Architect, Washington, or from the superintendent at Paris.

BIDS will be received by the School Board of Defiance, Ohio, up to April 20, for heating and ventilating the new six room school building in the Third Ward. Bids for both hot air and hot water will be received.

PROPOSALS will be received up to April 21 for the plumbing and hot water heating plant in the new City Hall at San Francisco, Cal.

THE Q N. EVANS CONSTRUCTION COMPANY, 41 Dey street, New York, have been awarded the contract for heating and ventilating the Gibson district school house at Boston, Mass. A steam plant on the blower system will be installed, at a cost of $12,523.

PROPOSALS will be received until May 1 for heating the Bellefield and Soho schools at Pittsburgh, Pa., with a steam or hot water plant.

THE J. L. MOTT IRON WORKS, 311 and 313 Wabash avenue, Chicago, are shipping a large number of bathtubs, water closets, lavatories, slop sinks, &c., to the new St. Nicholas Hotel, St. Louis.

THE WELLS & NEWTON COMPANY, 274 Dearborn street, Chicago, have secured the plumbing contracts for the stations of the Metropolitan Elevated Railroad at Halated street, Center avenue, Laughlin street and Marshfield avenue.

THE JOHN DAVIS COMPANY, 69 to 79 Michigan street, Chicago, have contracts for steam heating in the flat building of John Fiske, Forty-seventh street and Champlain avenue; station of the Lake Street Elevated Railroad at Rockwell street, and W. H. Purcell's buildings at Kensington, Ill.

THE HERENDEEN MFG. COMPANY, 131 Lake street, Chicago, have received an order from the Sanitary Heating & Plumbing Company of Peoria for three No. 9 Furman hot water boilers, to be placed in school buildings at Rushville, Ill.

JACOB G. WEBER, 244 North Clark street, Chicago, has the contract for plumbing in the apartment building of Richard F. Teale, Monroe street and Ogden avenue.

THE WINDSOR HEATER COMPANY of Galena, Ill., have secured the contract for heating the almshouse in that county. The contract is an important one, as both the main hospital building and the large asylum are to be heated. The company manufacture both steam and hot water heaters.

THE CONTRACT for the plumbing in the mansion of Charles Miller, at Nazareth, Pa., has been awarded to Fred. J. Rice of Bethlehem.

THE S. WILKS MFG. COMPANY, 113–123 Clinton street, Chicago, are to furnish one of the largest sized Wilks heaters, 42 x 48 inches, and a steel tank of 1500 gallons capacity, for the St. Benedict apartment building, Rush street and Chicago avenue. Also two large steel tanks and a 36 x 48 inch Wilks heater for I. C. Gifford's apartment building, Rhodes avenue and Thirty-third street. The firm have also received orders for four Wilks heaters from New York City, and two from San Francisco.

ARCHITECTS MURPHY & CAMP, Chicago, have designed for John Cashin a three story apartment house to be built on Prairie avenue, between Forty-fifth and Forty-sixth streets. It is to be heated by steam.

ARCHITECT ALFRED SMITH, Chicago, has planned for H. Wolf a two story, attic and basement residence, to be erected at 375 Ashland avenue. The interior will be finished in hardwood and heated by hot water.

ARCHITECT R C. BERLIN, Chicago, has designed for James A. Davidson a two-atory, attic and basement residence, to be built at 953 Jackson Boulevard. Furnace heat will be used.

ARCHITECT H. S. JAFFRAY, Chicago, has designed for W. R. Cowan a three-story apartment house, to be erected at Forest avenue, near Thirty-fifth street. It will be heated by means of a furnace.

ARCHITECT J. M. HOBKINS, Chicago, has made drawings for a suburban residence for O. L. Baily, to be erected at Oak Park, Ill. It will be frame on stone foundation, and provided with gas grates and combination heat.

ARCHITECTS FLANDERS & ZIMMERMAN, Chicago, have designed for J. Van Craenenbrock a three story apartment house, to be built at the corner of Fifty-fifth street and Monroe avenue. The interior will be divided into five stores and ten apartments, and will be heated by steam.

ARCHITECT J. H. MCELDORONEY, Chicago, has prepared plans and specifications for a fine residence to be built at Chicago Heights. Steam heat will be used.

ARCHITECT H. R. WILSON, Chicago, has designed for James M. Smith a three-story residence, to be built on Lexington avenue, near Fifty-first street. The interior will be finished in hard wood and heated by hot water.

KEHM & MERTZ, 289 East Kinzie street, Chicago, are to install a steam heating plant in the Woodlawn School, Lexington avenue, near Sixty-fourth street. The building contains 20 rooms and assembly hall.

TRADE REPORT.

The Iron Market.

In the Foundry Iron trade Philadelphia reports a good deal of activity, buyers having taken hold at the temptingly low offers made. Along the seaboard and in New England the unsettled condition of freights in Southern Iron leaves the situation in a mixed condition. It is pretty plainly intimated that very low rates are to rule and that prices of Pig Iron will be correspondingly cut. In the West buyers are hesitating about placing orders for Southern Iron, the feeling evidently prevailing that the recent concessions in freight rates have not yet reached the bottom.

Careful observers, while acknowledging that no early rise of any consequence is likely, do express the opinion that purchases at present prices are safe.

The renewal of troubles in the Connellsville coke region was a contingency which many in the trade have kept in view.

Pig Iron.—There has been a sharp cut in freight rates to interior New England points. Yet it is pretty plainly intimated by the railroad companies that special rates are simply a matter of negotiation. The result is that the market in New York and in New England is unsettled until it is definitely known what can be done. Sellers are practically giving away the whole of the advantage thus secured. Low prices have been made by Schuylkill Valley furnaces in New England. We note a sale of 1000 tons of Swedish Pig at private terms. We quote standard brands $12 50 @ $13.25 for No. 1; $11.75 @ $12.25 for No. 2; at tidewater. Southern Iron, same delivery, $12 @ $12.75 for No. 1; $11 @ $11.50 for No. 2; $10.75 @ $11.25 for No. 3; $11 @ $11.25 for No. 2 Soft, and $11.25 @ $11.50 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10.25 @ $10.75.

The volume of business in Pig Iron in the Philadelphia market has been considerably larger during the past few days, and while prices are lower holders feel very much encouraged by the liberal acceptances from leading consumers. Recently bids have been made and accepted for 500, 1000 and 3000 ton lots, with requests for options on additional quantities, all of which confirms the impression that business is improving. Besides this, other negotiations are fairly under way which promise to clean up all the odds and ends, or anything that is offered at attractive prices. Prices have been extremely low, lower than our inside quotations, but to get things moving holders were not inclined to stick at 25¢ a ton when the quantity was large enough to make it an object. There is an impression that very heavy cuts in freights are pending, and that, in fact, some of the sales just closed could not have been possible unless special arrangements of this kind had been made to enable the sellers to get out whole. What the exact figures are it is impossible to say, but they are understood to be much lower than ordinary quotations. General quotations for Philadelphia deliveries are about as follows, and from 25¢ to 40¢ less at interior points, such as Harrisburg and vicinity:

Standard No. 1 Foundry X	$12 50 @	$13.00
Standard No. 2 Foundry X	11.75 @	12 25
No. 2 Plain	10.75 @	11.00
No. 1 Soft	11.00 @	11.50
No. 2 Soft	10.50 @	10.75

Transactions for the week in the Chicago Pig Iron market have not been up to the average for the preceding four or five weeks. Local furnaces have taken the greater part of the business, such as it was. Southern sellers have done somewhat better in the country districts than in the city, but their sales have seldom exceeded 100-ton lots. The influence of the heavy reduction in freight rates from the South is felt unfavorably. Although the price of Northern as well as Southern Iron is now much lower than anything before known in this locality, yet buyers appear to have no confidence that values have actually touched bottom. They are disposed to wait for further developments and are apprehensive of changes in freight rates in other directions. Transactions are therefore confined to actual requirements in all kinds of Iron. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @	$15.50
Local Coke Foundry, No. 1	11.25 @	11.50
Local Coke Foundry, No. 2	10.50 @	11.00
Local Coke Foundry, No. 3	10.00 @	10 50
Local Scotch	11.50 @	11.75
Ohio Strong Softeners No. 1	13.00 @	14.00
Southern Silvery, No. 1	..... @	11.50
Southern Silvery, No. 2	..... @	11.00
Southern Coke, No. 2	10.00 @	10.35
Southern Coke, No. 3	9.75 @	10.00
Southern, No. 1, Soft	10.25 @	10.50
Southern, No. 2, Soft	9.75 @	10.00
Tennessee Charcoal, No. 1	15.00 @	15.50
Tennessee Charcoal, No. 2	14 50 @	15.00
Alabama Car Wheel	17.85 @	18.00
Jackson County Silvery	15.00 @	16.00
Other Ohio Silvery	13.00 @	13.50

In the Pittsburgh district some large sales of Bessemer Pig Iron have been negotiated. The short supply of Coke, owing to the Connellsville strike, is already having effect in the stoppage of furnaces. For the first time in some weeks there have been some good sales of Foundry Iron, but at the lowest prices touched. We are advised of a sale of 500 tons of No. 1 Foundry at a price equal to about $11, Pittsburgh, and one of 500 tons of No. 3 Foundry at a price equal to about $9 75, Pittsburgh. None of this Iron comes to Pittsburgh. Quotations are as follows:

No. 1 Foundry	$11 00 @	$11.25 Cash.
No. 2 Foundry	10.25 @	10.50 "
No. 3 Foundry	9.75 @	10.00 "

Metal Market.

Pig Tin.—Prices have moved about somewhat feverishly, but the extreme range covered was only about 30¢. The fluctuations were due in a great measure to the ups and downs of the London market. In other words, purely local conditions have had very little influence, if any, in shaping the course of values. The fact that London has a large stock on the spot and an unusual quantity afloat offsets all calculations of supplies, consumption, &c., on this side of the Atlantic, since it is uncertain when or to what extent Tin may be shipped from Europe to the American market. During the early part of the week under review some spot stock was sold at as low as 19.30¢. Subsequently 19.60¢ was paid in remote instances. Directly afterward 15 tons were sold on 'Change at 19.50¢ for prompt delivery, and 15 tons at 19 65¢ for June delivery. At the close the market softened somewhat under the influence of lower London quotations, but 19.50¢ net cash appeared to have been bottom rate for 5-ton lots, prompt delivery. Consumption is of about the same character and volume as it has been for some time past. It is still somewhat below the average for this season of the year. Small lots of Straits Pig from store are quoted at 21¢ @ 21¼¢ ℔ lb.

Copper.—The market for Ingot has remained quiet. At all events, none but very commonplace transactions have been reported, and the demand is represented as being quite as tame as it has been at any previous time during the past month or six weeks. Such as it is, however, the business passing is at practically former prices, and the market retains fairly steady tone despite the spiritless state of business. Lake Superior Ingot is quoted at 9⅛¢, prompt or future delivery. Electrolytic remains at 9¼¢ @ 9⅜¢, and over 9¢ @ 9⅛¢ is the exception on casting stock. For small retail quantities an advance of about 1¢ ℔ lb is the rule. The demand from consumers for both Ingot and Sheet Copper continues flat and disappointing. Exports from the United

States during the eight months ending February 28, as per statement of the Bureau of Statistics, were as follows:

	1894.	1893.
Ore—	Tons.	Tons.
To United Kingdom....	21,959	26,708
To Germany.....	1,016	78
To other Europe	none	none
Totals.....	22,975	26,786
	1894.	1893.
Ingots, bars and old—	Lbs.	Lbs.
To United Kingdom. ..	47,523,643	1,969,117
To Germany.....	18,160,862	2,260,306
To France.....	24,119,007	7,063,087
To other Europe.	50,601,917	6,605,578
To other countries.....	508,461	57,787
Totals.....	140,913,890	17,955,875

Pig Lead.—The destruction of the concentrator, ore houses and works of the Horn Silver Company, cutting off, as it did, a source of considerable supply and a free selling agency, caused heavy buying of the Metal. Nearly or quite 1500 tons changed hands at prices ranging from 3.37½¢ up to 3.45¢. Subsequently single carloads realized 3.47½¢. At this writing sellers are asking 3 45¢ @ 3.50¢. It is considered doubtful that the company will resume work within the next six months, and a firm market for Lead is therefore anticipated should the demand be normal. The Horn Silver mine production was about 600 tons ℔ month. A little more jobbing business was reported during the week, retail prices being firm at former quotations. Manufactured Lead remains dull.

Spelter.—Smelters who became tired of waiting for a better market dropped their prices suddenly a few days ago and the entire market became demoralized, with ordinary Western brands freely offered at 3.60¢ @ 3.62½¢, delivered here or at common point. As yet it does not appear that the lower cost has prompted freer buying by Eastern consumers and the market seems to be quite as flat as it was before the break took place. Since our last report 14 Western furnaces have closed down, making a total of 74 furnaces now idle, which were running at this time last year. It is reported that prices were forced down to compel these furnaces to close, and that lower prices are possible unless additional furnaces are added to the list of idle ones. The consumptive demand continues strictly moderate, and prices for small lots firm at 1¼¢ ℔ lb.

Antimony.—Dealings are moderate, and the market is barely steady, with 8¾¢ @ 9¢ quoted for Hallett's and 10¢ @ 10½¢ for Cookson's.

Nickel.—The market remains quiet, and 40¢ is still quoted as seller's price.

Tin Plates—In the earlier part of the week a very fair business was done in spot goods, chiefly in the shape of moderate sized lots for immediate delivery. Some few sales of large parcels, for both spot and future shipment, have also been made; the latter including some good sized orders for ordinary Bessemer Cokes for May and June delivery. The prices were, however, understood to be down to the level of the lowest current quotations. Forward shipments, nevertheless, do not command the interest usual at this time of the year, and the market is somewhat disappointing. The better movement was hardly maintained toward the latter part of the week. Prices are still rather uneven, with a slight leaning in buyers' favor, particularly for spot goods.

A special cable dispatch to *The Iron Age* from London, dated April 11, reports dullness in the British Tin Plate market. Small orders for Cokes are more plentiful at bottom rates, but the total is small. Sellers are cautious regarding forward contracts, owing to probability of stoppage of more works, possible labor troubles and belief that prices have reached lowest point. Stocks at Swansea about 287,000 boxes. Liverpool quotations for Plates were as follows:

IC Charcoal, Alloway grade.....	12/ @ 12/6
IC Bessemer Steel, Coke finish. ...	11/3 @ 11/6
IC Siemens " " "	11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20.....	Nominal.
Charcoal Terne, Dean grade.....	10/3 @ 10/6

Sheet Iron—Black Iron is exceedingly dull. Except in the case of light Sheets for tinning puposes the jobbing trade in this material is at a standstill, and prices are demoralized. Although quotations are brought down to the lowest prices yet made, these can readily be shaded on desirable orders. Galvanized Iron is in slightly better shape, owing to some increase of movement in the building trades, and prices are more firmly maintained.

Chicago Report.

Scrap.—Old Material continues neglected. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap.....	$7.00	....
Machinery Cast.....	6.00	....
Malleable Cast.....	5.00	....
Stove Plate (free of burnt)..	4.00	....
Burnt Iron and Grate Bars..	3.00	....
Sheet Iron and Hoops.. .	2.00	....
Plow Steel and Breaking Stock.....	4.00	....
No. 2, such as Shovels, Hoes, &c.....	3.00	....
Old Boilers—whole (Iron)....	3.00	....
" (Iron)—cut in single Sheets and Rings..	5.00	....
Old Gas-Pipe and Boiler Tubes.....	5.00	....
Cast Borings.....	3.00	....
Turnings.....	4.00	....
Horseshoes.....	8.00	....
Copper Bottoms.....	....	5 ¢
Copper Clips and Heavy.....	....	7 ¢
Heavy Brass.....	....	5½¢
Light Brass.....	....	3 ¢
Pipe Lead.....	....	2¼¢
Tea Lead...	....	2 ¢
Zinc.....	....	2 ¢
Rubber.....	....	3½¢

Anthracite.—Business is quiet. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch
Chicago, Ill.....	$5.00	$5 25
Milwaukee, Wis.....	5.00	5.25
Kansas City, Mo.....	8.20	8.45
Council Bluffs, Iowa.....	8.20	8.45
Lincoln, Neb.....	8.35	8.60
Sioux City, Iowa.....	8.20	8.45
Aberdeen, S. Dak.....	8.25	8.50
Dubuque, Iowa.....	6.30	6.55
Madison, Wis.....	6.50	6.75
St. Paul, Minn.....	7.50	7.75
Burlington, Iowa.....	6.50	6 75
Des Moines, Iowa.....	7.95	8.20
Davenport, Iowa.....	6.30	6 55
St. Joseph, Mo.....	8.20	8.45
Leavenworth, Kan.....	8.20	8.45
Omaha, Neb.....	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver.....	$8.00
Pueblo.....	8.00
Colorado Springs.....	8.00
Leadville.....	8.00
Cheyenne, Wyo.....	10.00
All points between Denver and Missouri River.....	8.85

Trade Notes.

THE CLIMAX MFG. COMPANY, 415 Cuyahoga Building, Cleveland, Ohio, are directing attention to the Climax Flour Sifter of their manufacture. It is described as being operated with one hand, and various other advantages are alluded to.

THE TRADE will be interested in the announcement elsewhere of the Cortright Metal Roofing Company, Broad and Hamilton streets, Philadelphia, Pa., relating to galvanized steel shingles. The company inform us that heretofore they have made their goods only in tin plate and copper, but recognizing the fact that some people prefer galvanized goods, they have placed themselves in position to fill their wants.

CURTIS & CURTIS of Bridgeport, Conn., manufacturers of the Forbes Patent Die Stocks and all kinds of Pipe Working Tools and machinery, find that their labor saving machinery and tools are coming into such general use abroad that they have decided to send out one of their firm to consult with their agencies which are scattered throughout Europe and to look after their interests generally. Lewis B. Curtis expects to sail on May 16, and will be absent about three months. They inform us that they are running their works with a full force and are very busy with both foreign and domestic orders.

THE GEUDER & PAESCHKE MFG. COMPANY, Milwaukee, Wis., the well-known manufacturers of tin ware, make two very attractive articles in the line of Flue Stops—the Cream City, decorated and gold lacquered, and the G. & P., a handsomely lithographed design. Both styles are put up in paper boxes of one dozen each and in wooden boxes containing one gross.

THE RUE MFG. COMPANY, 116 North Ninth street, Philadelphia, Pa., publish their illustrated catalogue for 1894. The goods noted in the circular are the specialties of the manufacturers, which include the Little Giant, Fixed Nozzle and Unique Injectors; also Rue's Patent Boiler Washing and Testing Apparatus. The devices are illustrated and prices are given.

E. S. WHEELER & Co., New Haven, Conn., who have a large and particularly well equipped warehouse, announce that they are in specially good position to handle the business of close buyers of Tinners' and Plumbers' Supplies in any section of the country east of the Mississippi River, and to supply their distant trade from factory connections near to buyers. Their offering in our advertising columns this week is special figures in Cement Wash Trays.

AVERY STAMPING COMPANY, Cleveland, Ohio, advise us that Mervin S. Near of New York will represent their interests in the East, while A. E. Bronson of Cleveland will look after their welfare in the West.

CONDITION OF THE

Hardware Trade.

TRADE CONTINUES somewhat uneven in volume, there being complaint in regard to it in some sections, while from others reports indicate that business is on the whole improving, though not attaining to the volume of last year. The demand, however, is more uniform than it has been for some time, covering as it does a more general assortment and indicating a return of a healthful condition. There is still evidence of great caution on the part of merchants in purchasing, and it is apparent that business is still moving somewhat sluggishly. The cold, inclement weather which has prevailed in many parts of the country has had the effect of repressing business somewhat. We regret that we are not justified in referring to the state of the market in the matter of prices as showing signs of improvement. On the contrary, there has been a gradual settling in the prices of many goods for some time, manufacturers making all possible concessions with a view to inducing business. The fact that wages have been quite generally reduced and have still a downward tendency has its influence in the same direction, and the result has been that on many lines of staple and Shelf Hardware lower prices are now ruling than prevailed a few months ago. The large buyers for the most part get the benefit of these reduced quotations, but there is a disposition on the part of many manufacturers to sell retailers in fair lots at prices which approximate those at which they sell the jobbing trade. There is also among the jobbing houses a disposition to cut prices on many leading goods. As a consequence of these conditions the market as a whole is in an unsettled state with a downward tendency. This naturally induces especial care in buying goods, merchants with scarcely any exceptions limiting their purchases to their early requirements.

Advices from Chicago.—The first week in April has proved a disappointment to Shelf Hardware jobbers. The volume of business has fallen considerably below that of the corresponding period in March. It had been hoped that the spring demand would extend over the month of April, but the trade was evidently without sufficient strength to carry it much further than the first. The falling off extends to all classes of goods and appears to be equally distributed throughout the city and country trade. The city trade is of course affected by the building troubles. The Heavy Hardware jobbers report about the same condition of affairs in their branch. March was an exceedingly good month, but with the recurrence of cold weather the demand for Heavy Hardware immediately declined. Business is now dragging.

Notes on Prices.

Wire Nails.—The demand continues good, manufacturers being in receipt of some relatively large orders from jobbing houses and a good many orders of moderate size from the smaller trade. The aggregate of business is fair, and the mills are generally well supplied with orders. They are, however, desirous of securing business to keep their mills in operation for the next month or two. Competition is thus active and prices relatively low. Ninety-five cents at mill for round lots probably represents the market, some manufacturers being unwilling to make this price, however, except on especially large and attractive lots. There is, however, little difficulty in obtaining this figure on carload lots. Small lots from store in New York are held at $1.20 to $1.25.

Advices from Chicago.—Jobbers appear to have control of the business now coming up. The quotations they make on carloads are as low as manufacturers' prices. This causes the Wire Nail market to appear weaker than the facts would justify, although some decline has taken place in manufacturers' prices. The competition is, perhaps, greater for business in this city than in outside territory. Carload lots are quoted at $1.05, Chicago, while small lots from stock sell at $1.15 to $1.20.

Cut Nails.—The condition of the Cut Nail market is substantially the same as last week, with some unevenness in quotations, especially as the Eastern manufacturers are feeling to some extent the effect of Western competition. The price of Nails in car lots, delivered in New York, is 95 cents to $1 base. Small lots from store in New York are held at $1.10 to $1.15, with concessions on larger lots.

Advices from Chicago.—Little is now heard of the attempt of the Ohio River manufacturers to sell in this market. Local manufacturers report a fair trade for the week, but the volume of business is somewhat below the average of the previous weeks. Prospects are good for a fair trade with the Dominion of Canada in consequence of the reductions in the tariff. Inquiries are being received from numerous Canadian points. Factory prices are unchanged at $1 on 55-cent average. Small lots are selling from stock at $1.15.

Barb Wire.—The demand for Barb Wire continues good, though not so heavy as a few weeks ago. There is also evidence of some irregularity in prices, and some of the manufacturers are making concessions on the regular quotations on Four Point Galvanized, delivered, which are as follows: Pittsburgh, $2.15; Cleveland, $2.20; Cincinnati or Allentown, $2.25 ; Chicago or New York, $2.35.

Advices from Chicago.—Business has fallen off considerably within the past week or ten days. Buyers generally appear to have covered their wants, and the trade will now experience a period of dullness until stocks pass into consumers' hands. Manufacturers are also again taking control of the trade with consumers. Inquiries for both Plain and Barb Wire are being received from Canadian points, and some sales have already been made. Prices on Galvanized Barb Wire are unchanged at $2.25 to $2 30 for carload lots, and $2 35 to $2.40 for small lots from stock.

New Brass List.—A new list was adopted by the Brass manufacturers on April 9. The list as thus revised corrects many inequalities in the old list, and with the new discount makes an advance in some goods, especially in Brass Tubing, the new prices of which are considerably higher than the old. The list prices of some of the goods have been revised simply with a view to making them, with the rest of the list, subject to a uniform discount of 40 per cent.

Bright Wire Goods.—The market for Bright Wire goods, which continues an open one, has recently been characterized by active competition between the different manufacturers, with the result of inducing considerably lower quotations than have heretofore prevailed. As a result a discount of 90 and 20 per cent. is obtainable. There is, however, some inequality in the prices quoted by the manufacturers, and some of them refuse to meet the extreme prices of their competitors.

Cordage.—The Cordage market is in no better condition than last week and prices are a shade lower. Manila is now more frequently sold at 6 cents base than it was a week ago, but some of the manufacturers are still holding it at 6¼ cents, these figures applying to large lots. Sisal is quotably lower, being now readily obtainable at 4 cents base. New Zealand is held at the same figure, but with a moderate demand. Notwithstanding the low prices which are ruling the volume of business is only fair, as current quotations seem to have little effect in inducing the trade to purchase beyond their present requirements.

Suction Faucet.—Suction Faucet No. 64, put on the market by the Enterprise Mfg. Company of Philadelphia, is sold to the trade at $5 each, subject to a discount of 25 and 10 per cent.

Aluminum Chafing Dish.—Wohler Aluminum Company, 55 Jackson street, Chicago, are putting this article on the market. The Chafing Dishes are listed at $12 to $14, the discount to the trade being 50 per cent.

Glass.—The improved condition of the Glass market referred to in our report of last week continues, and manifests itself by a tendency toward stiffer prices. Prices that have ruled for some time have been far from satisfactory, and with the prospective spring demand manufacturers are hoping for some concerted action among them-

selves toward securing better prices. This movement is more pronounced throughout the western natural gas belt, though it is reported that some Pittsburgh manufacturers have withdrawn their former quotations. The New York Glass market is represented by the following quotations: In small quantities, single strength, 85 and 5 per cent. discount; double strength, 85 and 10 per cent. discount. In 1000-box lots, single strength, 85 and 10 per cent., and double strength, 85 and 10 and 10 per cent. discount. Pittsburgh quotations are reported as being 85 and 10 per cent. discount for single, and 85 and 15 per cent. discount for double strength Glass at factory. The demand for Plate Glass, it is understood, is improving, though no change has taken place in prevailing quotations, and are reported from Pittsburgh as being 70 and 10 and 5 per cent. discount.

Old Metals.—Business is rather better in Old Metals, although prices show little or no improvement. Old Iron and Steel meet with comparatively fair sale, but the quantities involved are unusually small. Wrought Scrap particularly is in better demand in the New York market. The following quotations represent dealers' purchasing price, New York or Jersey City delivery:

Heavy Copper	₩ lb		7¢
Light and Tinned Copper	₩ lb		6¢
Heavy Brass	₩ lb		5¢
Light Brass	₩ lb		4¢
Lead	₩ lb		3¢
Tea Lead	₩ lb		2½¢
Zinc	₩ lb		2¼¢
No. 1 Pewter	₩ lb		15¢
No. 2 Pewter	₩ lb		6¢
Wrought Scrap Iron, ₩ gross ton		$7.50 @	$8.50
Heavy Cast Scrap, ₩ gross ton		7.00 @	8.00
Stove Plate Scrap, ₩ gross ton		4.00 @	5.00
Burnt Iron, ₩ gross ton		3.50 @	4.00

Old Rags, Paper, &c.—The volume of business in these materials has been fairly large, although not up to the general average of last month. Prices are steady but continue low, the following quotations being about the rate offered in this market:

No. 1 White Rags	₩ lb	3¼ @	3½¢
No. 2 White Rags	₩ lb	2 @	2¼¢
Mixed Rags	₩ lb		¾¢
Blues and 3ds	₩ lb	1 @	1¼¢
Hard Sized White Shavings	₩ lb	2¼ @	2½¢
No. 1 White Book Shavings	₩ lb	1¾ @	2 ¢
No. 2 White Book Shavings	₩ lb	1 @	1⅛¢
Light Book Shavings	₩ lb		¾¢
No. 1 Mixed Shavings	₩ lb	¾ @	1 ¢
No. 2 Mixed Shavings	₩ lb	½ @	¾¢
No. 1 Printed Books	₩ lb	1 @	1¼¢
Ordinary Mixed Books	₩ lb	½ @	¾¢
Newspapers	₩ lb	2-5 @	½¢
No. 1 Manila Paper	₩ lb	1 @	1¼¢
No. 2 Manila Paper	₩ lb	⅝ @	¾¢
Bogus Paper	₩ lb		½¢
Common Paper	₩ lb		⅜¢
Straw Chips	₩ lb		½¢
Binders' Clippings	₩ lb	½ @	⅝¢
Jute Butts	₩ lb	1⅞ @	2 ¢
No. 1 Jute Bagging	₩ lb	1 @	1¼¢
Mixed Bagging	₩ lb	¾ @	1 ¢
No. 2 Bagging	₩ lb	½ @	¾¢
Hemp Twine	₩ lb	2 @	2¼¢
Manila Rope	₩ lb	2¼ @	2⅝¢
Jute Rope	₩ lb	1½ @	1¾¢
Mixed Rope	₩ lb	¾ @	⅞¢

Old Rubber.—The market for Old Rubber shows some improvement, but prices are somewhat irregular. The following quotations represent approximately those given by dealers in this city:

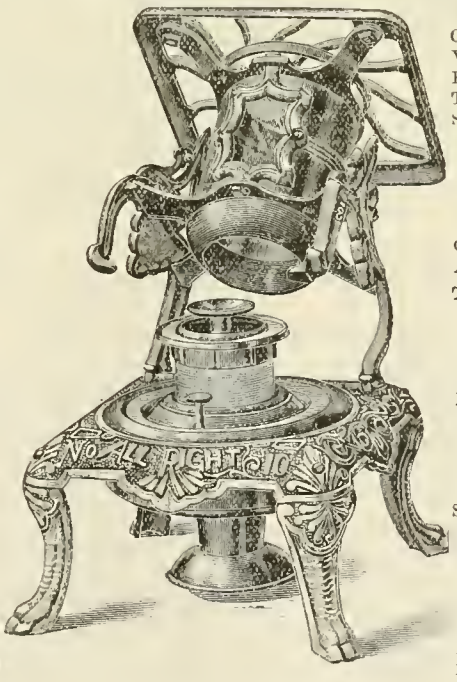
Car Springs, ton lots, ₩ lb		@	$0.03½
Rubber Shoes, carloads, delivered at factory, ₩ lb		@	.03½
Rubber shoes, less than carloads, ₩ lb		@	.03¾
Large Hose, ₩ ton		@	12.00
White Wringer Rolls, ₩ lb		@	.03¾
White Syringes, ₩ lb		@	.03¾

THE GILBERT & BENNETT MFG. COMPANY, 148 Lake street, Chicago, are now manufacturing Poultry Netting at their Chicago factory. It is made of wire galvanized before weaving. The company state that while they do not regard it equal in durability and strength to standard "G. & B." Netting galvanized after weaving, it is made of as good material, as perfectly woven and rolled up in the same manner as all other Netting of the same kind. The company are therefore prepared to furnish the trade with either kind of Netting, galvanized before weaving or galvanized after.

E. T. BARNUM, Detroit, Mich., issues a very extensive illustrated catalogue of his wire and iron goods. The pamphlet, which contains 120 pages, is profusely illustrated and shows a varied line of art and iron work. Settees, chairs and benches are followed by gates, netting, guards, &c. Later on attention is given to stable fittings, then come railings, fire escapes, stairways, grills, crestings, finials, weather vanes, &c.

The All Right Lamp Stove.

The Coldwater Oil Stove Company of Coldwater, Mich., are manufacturing a lamp stove of their own design, which is herewith illustrated. The cut shows the No. 10 stove, with the top thrown back in position for lighting or trimming the wick. This stove stands 14 inches high, the top is 8 inches square, the lamp is a central draft lamp of high power, and the oil tank is made entirely of drawn brass. The base and frame are of cast iron, fully nickeled. The No. 15 stove has a longer base, holding two lamps, and thus making it double the capacity of the No. 10. An oven is made by the company of suitable size for this stove which is capable of doing a considerable range of work. They have their own foundry and nickeling plant and make all parts of these stoves.



The All Right Lamp Stove.

BURT COLE has moved his tin shop to the store formerly used by J. B. Keasler as a storeroom, at Adrian, Mich.

A. LA ROCK is to continue the tin and plumbing business at Franklin, Vt., at the old stand of W. H. Lautman & Son, who have moved to East Highgate.

CANONSBURG IRON & STEEL COMPANY of Pittsburgh, Pa., with works at Canonsburg, Pa., started up their new tinning pots on March 22 for the manufacture of tin and terne plate. The plant has a capacity of 80 boxes per day.

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Metal and Miscellaneous Prices.

CHICAGO, APRIL 12, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	$5.65 @ $5.75
IC, 14x20, 90 lb	@ 5.25
IC, 14x20, 100 lb	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @ 11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal, extra, IC, 14 x 20..... 7.25
Morion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$8.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.25
Crescent, IC, 20 x 28	@ 11.75
Crescent, IX, 20 x 28	@ 14.75
Emoire, IC, 20 x 28	@12.00
Empire, IX, 20 x 28	@15.00
Hickory, IC, 20 x 28	@ 12.50
" IX, 20 x 28	@ 15.50
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.00
Westmoreland: IC, 14 x 20	$5.87½
IC, 20 x 28	11.75
Elwood: IC, 20 x 28	$11 75
Juno: IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method: IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie: IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00
Old Process: IC, 14 x 20	9.25
IX, 14 x 20	11.25
IC, 20 x 28	18.50
IX, 20 x 28	22.50
H. B. L., Old Style: IC, 14 x 20	7.75
IX, 14 x 20	9 25
IC, 20 x 28	15.50
IX, 20 x 28	18.50

Sheet Iron—

Black.

Nos.	Common American	Refined.
10 to 16	₩ lb 2 4-10¢	3 ¢
17 to 20	₩ lb 2 5-10¢	3 1-10¢
21 to 24	₩ lb 2 6-10¢	3 2-10¢
25 and 26	₩ lb 2 7-10¢	3 3-10¢
27	₩ lb 2 8-10¢	3 4-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ lb A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.. ....dis. 75%

Copper—

Ingot.

Lake.....11¢ @ 11½¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list, 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gliding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ₩ 100 lb.

Above 5-16 inch to 3 inch inclu.	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ lb
Bronze Tubing, 3¢ ₩ lb more than Brass	

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 lb casks.....4¾¢
300 lb casks.....5 ¢
Loose sheets.....5¼¢

Lead—

Soft Pig Lead.....3¾¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12½¢@12¾¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12½¢
Hallett's.....11½¢@11¾¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	60&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	70&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrogated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles: Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ lb, 2 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, B. Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Brown	₩ lb, 5½¢
" Ground in oil, Purple	₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls	51¢
Linseed Oil, Raw, in bbls	51¢
Mineral Paints	2@4@
Orange Mineral	9½¢
Pure White Lead in Oil	6@8½¢
Dry White Lead in bbls	5½@6½¢
Red Lead, American	6@8½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¾¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ₩ gal	84¢
Spirits Turpentine, in bbls., ₩ gal	35½¢
Asphaltum, Trinidad Refined, ₩ ton	$45
Tarred Felt, 1 Ply, ₩ 100 lb	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.70
Roofing Pitch, lb bbl. of 300 lb	$3.00

NEW YORK, APRIL 13, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:	
Small lots	₩ lb, 75¢
100-lb lots	₩ lb, 73¢
Ton lots	₩ lb, 70¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:	
Small lots	₩ lb, 70¢
100 lb lots	₩ lb, 65¢
Ton lots	₩ lb, 60¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:	
Small lots	₩ lb, 65¢
100-lb lots	₩ lb, 60¢
Ton lots	₩ lb, 55¢

Antimony—

Cookson.....₩ lb, 10¾¢
Hallett's.....₩ lb, 10 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894

Plain Round Tube.	Per ft.
¾-in. up to 2-in., to No. 19, inc.	$ 1.25
⅝-in. up to ⅞-in., to No. 19, inc.	.96
½ in. up to ⅝ in., to No. 19, inc.	.68
⅜-in. up to ½ in., to No. 19, inc.	.41
5-16-in. up to ⅜ in., to No. 19, inc.	.38
¼ in. up to 5-16-in., to No. 19, inc.	.25
3-16-in. up to ¼-in., to No. 19, inc.	1.00
⅛ in. up to 3-16-in., to No. 19, inc.	1.50
Smaller than ⅛-in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 19, inclusive	.38

30% @ 5%

Copper and Bronze Tubing—

8¢ ₩ lb more than brass.

Bronze, Tobin—

Bronze Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ₩ lb
Over 3½ to 5 inches inclusive....18 ₩ lb

Bronze Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ₩ lb
Over 3½ to 5 inches inclusive....19¢ ₩ lb

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square*—
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

*Bottoms, Pits and Flats..*12¢ ₩ lb, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10 ¢
Ansonia Grade Casting.....9½¢
Planished.....net
Sheet and Bolt. ....15¢ ₩ lb, net, basis

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint, Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.96	.99	1.20 per doz..20%

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

Nos.	Common American.	R. G. Cleaned American.
10 to 16	₩ lb, 2.50	2.80¢
Nos. 17 to 21	₩ lb, 2.60	2.90¢
Nos. 22 to 24	₩ lb, 2.70	3.00¢
Nos. 25 and 26	₩ lb, 2.80	3.10¢
No. 27	₩ lb, 2.90	3.20¢
No. 28	₩ lb, 2.95	3.30¢
American B. B.	₩ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11¾@12½¢
Patent Planished....₩ lb, A, 10¢; B, 9¢, 8¢
Craig Polished Sheet Steel.....₩ lb 8¾¢

Galvanized.

	B. B.
Nos. 10 to 16	70&10@75%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Filter Joints—

Lee's.....33⅓%

Lead—

American Pig	3¾¢@4¢
Bar	4½¢
Pipe	5¾¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	6½¢, 20%

Old Lead in exchange, 2¾¢ ₩ lb.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¾
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1¾ @ 2¾

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

ntty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans..... .01¾ @ .02¼
In bladders..... .01¾ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 Ply, ₩ ℔.....2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl.....$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, Inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....₩ bbl. $1.19@$1.20
Rosin, E. & F..... ₩ bbl. $1.30@$1.45
Rosin, G. & H.....₩ bbl. $1.65@$1.90
Rosin, I. & K.....₩ bbl. $2.25@$2.60
Rosin, M. & N.....₩ bbl $2.90@$3.00

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slatee, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ½..... 13½@11¢
No. 1..... 11¾@12½¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.

f.o.b. New York.
In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔.....8½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg. } 5% dis.
Kegs, about 55 ℔, ₩ ℔.....4¢

Yager's Soldering Salts.
¼-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter..... 4¼¢
Bertha (pure).....8¢@8¾¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 21¾¢
Straits, pigs, ₩ ℔..... 21¢ @ 21½¢
Straits in bars, ₩ ℔.....22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20 . $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 5.50
" IX, 14 x 20..... 6.50
Atlantic, IC, 14 x 20..... 5.75
Bonus, Extra Coated, IC, 14 x 20.... 6.75
" " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28 ..... 11.50
Central, IC, 14 x 20 ..... 5.37½
Climax, IC, 14 x 20 ..... 5.50
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
Dane, IC, 14 x 20 ..... 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 .... 12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20 ....6.12½
Extra Central, IC, 14 x 20..... ..5.62½
Flag, IC, 14 x 20..... 5.25
Fort Pitt, IC, 20 x 28..... .....11.00
Globe, IC, 14 x 20..... ..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20... 6.25
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... ..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20 ..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20 ..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20 ..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... .....12.00
" IX, 20 x 28 ..... 15.00
Newcastle Real Old Method, IC, 14x20. 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Sheuango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20 ..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20 ..... 5.25
Palacio, IC, 14 x 20..... 5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 8.00
Phœnix, IC, 14 x 20..... 5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Reaqnared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, C (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20 ..... 5.37½
Vigilant, IC, 14 x 20 ..... 5.50
Waldo Redipped, IC, 14 x 20..... 6.75
Westmoreland, IC, 14 x 20.. .... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.50
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Iowa, IC, 14 x 20 ..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merlon, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" " IX, 14 x 20.. 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" " IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7 25
Versailles, IC, 14 x 20..... ...5.75
Youghiogheny, IC, 14 x 20.....6.00

Imported Terne Plates—
Charcoal.

MF Grade, IC, 14 x 20.....$7.50
20 x 28..... 15.00
IX, 14 x 20..... 8.75
20 x 28.....17 50
Pontymister Grade, IC, 14 x 20..... 6 50
20 x 28.....13.00
IX, 14 x 20..... 7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20..... 5.75
20 x 28..... 11.50
IX, 14 x 20..... 6 75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20... .....$5.37½
20 x 28.....10.70
IX, 14 x 20..... 6.40
20 x 28..... .....12.80
Abercarne Grade.—IC, 14 x 20..... 5.25
20 x 28.....10.50
IX, 14 x 20..... 6.40
20 x 28.....12.80

Imported Bright Plates
Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Calland Grade.	IC, 10 x 14	$6.37½
" "	IC, 12 x 12	6.62½
" "	IC, 14 x 20	6.37½
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.87½
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
" "	DC, 12½ x 17	5.50
" "	DX, 12½ x 17	6.50

Coke.
Steel Coke.—IC, 10x14, 14x20 $5.25@$5.35
10x20..... 8.12½
20x28.....11.00
IX, 10x14, 14x20..... 6.60
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plates
IXX, 14x28..(112 sheets).....$13.85
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper..... ....net

Tubing—

Brass and Copper.—

Standard List..... 25@30%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz.... 18.00

Zinc—

600 ℔ casks..... ..... ₩ ℔ 4½¢
Per ℔..... .....5¢@ 5½¢

It Is Reported—

Alabama.

That the Hardware firm of Luttrell & Fuller, BREWTON, has been succeeded by Luttrell, Fuller & Co. The only change made in the business was the admission to partnership of R. E. Mallett, who has for several years past been in the employ of J. Randolph Brown of Troy, and who is referred to as a Hardwareman of considerable ability and experience.

California.

That Z. C. Mathes has opened a new Hardware store in the Snyder Block, SAN DIEGO.

Florida.

That W. H. Parkin, formerly of Cleveland, Ohio, will soon open a new Hardware store at PALM BEACH, DADE COUNTY. Palm Beach is the terminus of the new Jacksonville, St. Augustine & Indian River Railroad. Mr. Parkin's store will be the only exclusive Hardware store at Palm Beach, which has grown largely during the last six months He expects to conduct both a wholesale and retail business.

Illinois.

That Hopkins Bros., CENTRAL PARK, have purchased the Hardware and Tinware stock of H. E. Rebmann. Mr. Rebmann contemplates taking a trip to California.

That the Hardware stock of Wadsworth & Matheson, JACKSONVILLE, was completely destroyed by fire on the 26th ult. The loss is estimated at $30,000.

That S. F. Yeager & Son of PEARL CITY have disposed of their Hardware stock to John Klapp and A. M. Schotz.

That S. O. Stillman, GALENA, has been succeeded in the Hardware business by Stillman & Stahl.

Indiana.

That J. W. Miller has purchased an interest in the Hardware store of F. V. B. Minnich, GOSHEN. The style of the firm will hereafter be the Minnich Hardware & Furniture Company.

Iowa.

That W. H. Sedam is a new Hardwareman at STANWOOD.

That Kunz & Fay's Hardware store, BELLEVUE, was burglarized on the 26th ult. Thirty dollars' worth of goods were taken by the thieves.

That Liebig & Sons, KALONA, have sold their Hardware store to Lucas, Rust & Smith of KINROSS.

Kansas.

That the Woodbine Hardware Company's store, at WOODBINE, was destroyed by fire on the 29th ult.

Maine.

That F. T. Dana, WISCASSET, dealer in Hardware and Cutlery, has removed to a new location in that place.

Massachusetts.

That the Stove stock of Folger & Reagan, GLOUCESTER, was damaged by fire on the 5th inst.

That Thurston, Hale & Co. have recently entered the Hardware business at ROCKPORT.

Michigan.

That the dynamite storehouse of the Ferguson Hardware Company, SAULT STE. MARIE, blew up on the 31st ult. It contained 5000 pounds of the explosive. The explosion shook the entire town and broke many windows.

That D. Leach, MINDEN CITY, is now conducting the Hardware business formerly carried on by Geo. W. Thayer & Co.

That J. C. Cozad has succeeded A. B. Kleaber in the Hardware business at WAYNE.

That L. S. Dickinson's Hardware store at FENNVILLE was recently entered by thieves, who took away about $60 worth of Knives, Razors and Revolvers.

Minnesota.

That H. A. Boyer of FOUNTAIN has purchased the Hardware and lumber business of John Johnson, and will take possession of it on May 1.

Missouri.

That the Hardware stock of H. A. Walcott, CARTHAGE, was damaged by fire to the extent of several thousand dollars on the 30th ult.

New York.

That John Lilley's Hardware store at BAINBRIDGE was burned out on the 2d inst. The loss was fully covered by insurance.

That Murphy & McEligott's Hardware store at CLYDE was slightly damaged by fire on the 3d inst.

That Leonard Jones of Remsen has entered the Hardware and Tin business at HINCKLEY.

That Frank Hall, Hardware merchant of PRATTSBURGH, has sold out to Flynn & Walker.

That Peter J. Kimmel has bought a half interest in the Hardware business of M. Kimmel & Son of COHOCTON.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

STOVE SALESMAN in Massachusetts, Rhode Island, Connecticut, New York and Pennsylvania can make good side commission by addressing O. G. & D. H. Donaldson, Buffalo, N. Y. Apr. 14

A young man that understands tin and sheet iron business; one that can read and write a good hand and is capable of taking charge of store; please state wages wanted. "Capable," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

An A 1 STOVE SALESMAN for New York City trade; state age, experience and salary wanted. "J. B.," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

SALESMAN for a first-class line of stoves for Ohio, Illinois, Minnesota and Wisconsin. "N. H.," No. 414, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

A first-class TINSMITH at once to work on milk coolers; one preferred with small capital. H. W. Gazley, Cortland, N. Y. Apr. 14

A RETINNER, with experience in retinning tinware, and capable of taking charge of a retinnery; steady job to capable man. Standard Stamping Company, Second and Chambers streets, St. Louis, Mo. Apr. 14

A competent PLUMBER; one used to country work preferred; to a man that is not afraid of doing a good day's work steady work and fair wages will be paid; state experience and wages expected. Burbank, Studd & Metze, Berlin, N. H. Apr. 14

TRAVELING SALESMEN, visiting the retail hardware trade, to handle our goods as a side line; no samples to carry; sales made from catalogue and small nickel model weighing 2 pounds or less; full information and catalogue sent on application. Lock Box 34, Pike, N. Y. Apr. 14

PLUMBER and TINNER for country shop; must understand his business; one with some knowledge of the hardware business preferred; steady job to the right man; immediately; state age, wages and experience; married or single. O. H. Tebay, Leechburg, Pa. Apr. 14

SALESMEN calling upon the gasoline stove, hardware or grocery trades, to handle our complete line of oil cans, tanks, &c., on commission; easy sellers, right prices and liberal commission. "Oil Cans," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

A good boy between 16 and 18 years of age to learn the tinning and plumbing trades; one who will serve for three years; $50 a year, board and washing; good home for a good boy. A. M. Kreider, Lititz, Pa. Apr. 7

A good all round TINSMITH, with some knowledge of plumbing; temperate and industrious; to the right party a steady position is open; state wages expected. 545 Main street, Niagara Falls, N. Y. Apr. 7

By a tin plate and metal house, a first-class SALESMAN who thoroughly understands tin plates, sheet iron, brass and copper goods, to travel in the West. Address, with references, P. O. Box 1530, Philadelphia, Pa. Apr. 7

SITUATIONS WANTED.

By a good TIN, SHEET IRON and FURNACE WORKER; understands steam and hot water fitting and the combination steam and hot air work. Chas F. Snyder, 73 East Louisa street, West St. Paul, Minn. Apr. 14

By a young man 20 years of age, with three years' experience at plumbing and gas fitting; can wipe a good joint; some knowledge of tin, sheet iron and range work; city or country. F. V. Martin, Box 153, New Milford, Conn. Apr. 14

By a TIN and SHEET IRON WORKER, who is also a gas and hot water fitter; 15 years' experience at general jobbing; reference. J. Walden, New Rockford, N. D. Apr. 14

By a perfect TIN, SHEET IRON WORKER and ROOFER; steady position in or out of town. T. Greenberg, 64-66 Canal street, New York City. Apr. 14

By a practical TIN and SHEET IRON WORKER; some knowledge of furnace, range, heater work, roofing and general jobbing. "Tinsmith," 242 North Second street, Williamsburg, Brooklyn, N. Y. Apr. 14

By a PLUMBER; learnt trade in Philadelphia; plumbing, gas, jobbing or steam work, sanitary drainage, and house wiring on Edison system; age 23; honest, sober and willing to work; can furnish reference. Henry M. Wendel, 32 S. Wyoming street, Hazleton, Pa. Apr. 14

By a TINNER; four and a half years' experience; can do roofing, spouting, stove, pump and shop work; strictly temperate; best of references. A. F. Segerstrom, Forest City, Iowa. Apr. 14

By a first-class PLUMBER; city or country; 15 years' experience as an all around worker. J. M. Harrington, 140 Degraw street, Brooklyn, N. Y. Apr. 14

By a CORNICE and SKYLIGHT MAKER, as FOREMAN of a small shop or assistant cutter in a large shop; nine years' experience; 27 years of age; understands English and German. L. D. Retman, 111 Delancey street, New York City. Apr. 14

By a good TINSMITH, for in and outside work, used to country work, also general jobbing; willing to work in city or country. Address J. Cohen, 148 Delancey street, New York City. Apr. 14

By a practical MECHANIC and INVENTOR on tin and iron work, spinning and drawing press iron. E. Plancom, 863 Park avenue, Brooklyn, N. Y. Apr. 14

By a TINNER; can do roofing, bench and furnace work; 14 years' experience at trade; strictly temperate and reliable and not afraid of work; would like position where I could learn pipe fitting. "G. A. B.," 147 Cabot street, Lowell, Mass. Apr. 14

By a first-class PLUMBER; not particular as to locality. J. Reilly, 504 West Twenty-eighth street, New York City. Apr. 14

By a good TINNER; eight years' experience at inside and outside work, general jobbing and furnace work; some knowledge of clerking; can make up tinware; sober and reliable; good references. Wm. F. Gritzmacher, Faribault, Minn. Apr. 14

A married man desires a steady situation at moderate wages with a good firm as SLATE and TILE ROOFER; understands his trade thoroughly and is capable to do tin and iron roofing and all kinds of jobbing; good workman with best of references; reason for desiring a position—former employer retired from business. "Slate and Tile Roofer," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

As BRASS MOLDER; well experienced on any class of work; location no object; an engineers' jobbing shop preferred. "W. B.," 36 Sampson street, Allegheny, Pa. Apr. 14

By a steady, sober and reliable TINNER; 15 years' experience on general work; reference furnished if required. "Tinner," 249 West Eleventh street, Anderson, Ind. Apr. 14

By a practical TINSMITH, ROOFER and GENERAL JOBBER; thoroughly experienced; city or country. Jacob Goodman, 99 Forsyth street, New York City. Apr. 14

In Wisconsin, Illinois or Iowa, by a good TINNER; 14 years' experience at all kinds of work; can speak English and German and clerk in store; married; strictly temperate; first-class references; two and one-half years with last employer. H. G. Habedank, Albany, Wis. Apr. 14

By a first-class high and low pressure STEAM and HOT WATER FITTER; can make working plans and solicit work; expert at hot water; lots of experience; no objection to traveling; best of references. "Success," No. 414, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

FOREMANSHIP, by practical tin and sheet iron worker; can handle any number of men judiciously; best of references; sheet metal specialties preferred. C. Harvey, 251 Fourteenth street, Buffalo, N. Y. Apr. 14

As MANAGER or FOREMAN of stove works; 24 years' experience; understands the business in detail; thoroughly practical in mounting, polishing, plating and pattern fitting; has always handled men to the best advantage. "A. W. C.," care of Fred. W. Donnelly, 912 Carroll avenue, Chicago. Apr. 14

By a young man, 28 years of age, with five years' experience in the retail hardware and farm implement business; has natural talent for machinery; is sober and industrious; best of references. P. O. Box 65, Cordova, Md Apr. 14

By a first-class SKYLIGHT and CORNICE MAKER and CUTTER; can work from plans; willing to work at the bench or to take charge of shop; best of references; can speak English and German; willing to go on trial for a month; strictly sober and reliable. M. Grossman, 193 River street, Paterson, N. J. Apr. 14

As FOREMAN of stove mounting shop by a practical man; can handle any number of men; best of references. Geo. Balles, 163 Mackinaw street, Buffalo, N. Y. Apr. 14

A boy, 17 years old, with some knowledge of the plumbing trade, would like to learn it thoroughly. I. H. Singer, 222 Second street, New York City. Apr. 14

By a young man as TINSMITH; experienced in city and country work; position desired near New York City. Fred Waxman, 1208 First avenue, New York City. Apr. 14

A young man with two years' experience in the roofing, range and furnace trade would like to get a position as apprentice; good reference; will work anywhere in the United States. M. J. Walsh, 324 East Fortieth street, New York City. Apr. 14

A steady position by a competent STEAM FITTER and GENERAL JOBBER; one that has a good knowledge of plumbing and fully up in pump work; eight years' experience; not afraid to do a day's work; now employed in Boston, but wants a change. T. Frank Clark, 2 Trenton street, Charlestown, Mass. Apr. 14

By a first-class PLUMBER, city or country. C. J Smallen, 305 West Thirteenth street, New York City. Apr. 14

By a graduate of the plumbing department of the New York Trade School where he could be under instructions by May 1; no objections to a distant locality; best of references. "W. H. V.," Box 35, East Hampton, L. I., N. Y. Apr. 14

By a TINSMITH of 20 years' experience at inside and outside work; general jobbing, furnace, steam, hot water and plumbing; references; steady job by the year. "T.," Box 414, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

By a first-class TINSMITH, on or about April 15; 22 years' experience; both inside and outside workman; understands furnace and range work in all its branches; can do iron pipe work and pump work. "Tinner," Long Branch City, N. J. Apr. 14

By a TIN and SHEET IRON WORKER; 12 years' experience; understands all outside work, gutters, roofing, furnace, stove, range and fireplace heater work and general jobbing; city or country. L. Saltman, 137 New street, Philadelphia, Pa. Apr. 14

Steady work, by a young man used to all kinds of tin, sheet iron and furnace work; some knowledge of lead and iron pipe work; sober and good workman. T. H. Atkinson, Virginia P. O., Ontario, Canada. Apr. 14

By a young man, 21 years of age, with seven years' experience at PLUMBING and GAS FITTING; country preferred. Henry N. Will, 18 Dodworth street, Brooklyn, N. Y. Apr. 14

By a first-class PLUMBER; city or country. Joseph Smollen, 533 West Thirty-ninth street, New York City. Apr. 14

By a PLUMBER and GAS FITTER; strictly sober; wages moderate. Henry W. Bauer, Paris, Ky. Apr. 14

By a first-class CORNICE MAKER; ten years' experience; understands all kinds of work; city or country. R. Schatz, 603 Poplar street, Philadelphia, Pa. Apr. 14

By a TINSMITH, inside and outside worker; understands furnace, range and heater work, also roofing and plumbing; married man; 25 years' experience; good references. Lock Box 102, Sterling, Kan. Apr. 14

By a practical TINSMITH, German, steady, for all kinds of jobbing, roofing, furnace, range and heater work; understands also plumbing and gas fitting. Printing Office, 521 Sixth street, New York City. Apr. 14

By an ELECTRO PLATER of long experience in silver, nickel and brass; best of references; wages moderate. H. M. Ostrander, Albany, N. Y. Apr. 14

With good firm doing hot air heating; have had several years' experience; am capable of estimating work from plans and handling men; would prefer job with firm doing both hot air and hot water work; will not go East; would accept position with firm as traveling salesman for good hot air furnace. "N. H. L.," Station A, Pittsburgh, Pa. Apr. 14

By a PUMP MAKER on first-class work only; best of references. Fred. Kennebecker, Middletown, Conn. Apr. 14

By a thoroughly experienced MANAGER with long foundry experience; successful in establishing and running foundry agencies, wholesale and jobbing houses; bookkeeper and salesman. "Successful," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 7

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, April 21, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....812 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Modern Plumbing.

To the interested observer a growing change in plumbing work can be seen. The skillfully executed and beautiful lead work that has been the pride of the plumber since the craft first came into existence fails to hold the people loyal to it. As the handsome white porcelain lavatory and the earthware water closets have supplanted the appliances of a few years back, so have the nickel plated traps and pipes grown in favor. The use of wrought iron for both drainage and service pipes has made rapid advance recently. A plumber of the old school who has never left the vanguard recently said that in his highest class work he frequently used less than 100 pounds of lead on jobs where formerly tons would have been used. Another plumber who seeks only contracts where the very best work will be demanded stated that what he considered the finest job of plumbing in the United States did not have a pound of lead used on it. And so the practice of the trade is changing, and the plumber, who as his name implies was originally a worker in lead, is becoming more and more a worker in iron and other metals. Or to speak more accurately, he is not so much a worker in metals as a worker in metallic goods; a domestic engineer whose business it is to lay out a system of plumbing and install the apparatus with their proper connections.

The Franklin Trade School.

It is announced that the trustees of the Franklin Fund in the city of Boston have definitely decided that the sum available—now amounting to about $300,000—shall be devoted to the establishment of a trade school, after the pattern of that in New York. A committee of the trustees, accompanied by the City Architect, are about to visit the schools of this nature now in operation in New York, Brooklyn, Philadelphia and other places, in order to obtain the necessary practical information as to buildings, equipment and methods. Their intention, it is said, is to have the plans drawn and the work of building begun at the earliest practicable moment. When erected and equipped the institution must, according to the terms of Franklin's will, be transferred to the city, which will be responsible for its permanent maintenance.

The Tin Plate Situation.

One of the marked features of the present tin plate situation, induced by tariff uncertainty, is the large and increasing proportion of tin plates held in bond at New York, as shown by the returns for March 31, 1894. The value of such material in bond at that date was nearly double that of tin plate in bond at the end of February. The quantity thus held at the end of March was 4300 tons, compared with 2376 tons on the same date in 1893, although the importation for the first three months of this year was much below that of the corresponding period in 1893. The reason is not far to seek. Importers are not inclined to pay the existing duty on any large amount of stock, which may be left on their hands at a considerably reduced value in the event of a reduction in the tariff. Consequently they are content to withdraw from bond only such goods as they can readily dispose of at present prices. Meanwhile shipments from the other side are not increasing in any material degree, and free stocks in dealers' hands have been shrinking week by week and are now of unprecedentedly small proportions. Should a sudden expansion in the demand develop for any reason, such as an unforeseen access of energy on the part of the Washington lawmakers, resulting in the summary passage of the new tariff law, importers and jobbers of tin plates would be in a very poor position to meet the same. The English exports of tin plates to the United States in tons for the first three months in each of the past five years were as follows: 1894, 48,616; 1893, 75,022; 1892, 62,611; 1891, 98,909; 1890, 59,197.

A novel and effective method adapted by the Philadelphia branch of the Women's National Health Protective Association for abating nuisances is photography. In a certain quarter of the Quaker City the refuse from a stable and from an adjoining cigar factory had long been piled together in a heap that was a nuisance and a menace to the health of all who resided in the neighborhood. A member of the association had the objectionable mass photographed, and sent a blue print of it, with her complaint, to the Board of Health. The nuisance was promptly abated.

An Open Letter on Profit Sharing.

The Association for the Promotion of Profit Sharing has issued the following letter. It is signed by Carroll D. Wright, Washington, president; Francis A. Walker, Boston, N. O Nelson, St. Louis, vice-presidents; N. P. Gilman, Boston, secretary; R Fulton Cutting, New York, Alfred Dolge, New York, R. R. Bowker, New York, Henry R. Towne, Stamford, Conn., George A. Chace, Fall River, Mass., directors:

In anticipation of a revival of business and the consequent reopening of many mills and factories, which now seems probable, we would invite your attention to the importance of introducing some form of profit sharing as a feature of your industrial relationships. The method of paying a dividend to the workman out of profits as they are realized annually has been approved by most of the economists of Europe and America as thoroughly practical, and advantageous to both the employer and the employed. We will mention a few characteristics which should commend it to your careful attention.

Profit sharing can be adopted by an employer without risk of loss, inasmuch as he assumes under it no obligations except such as are to be discharged from profits actually made. His prerogatives as manager and his rights as proprietor are not curtailed. Profit sharing would establish a more friendly relationship of common interest between working people and the employer. This would be the surest pledge of industrial peace and the firmest support in times of commercial distress.

The employee, responding to such an advance by the employer, can increase the quantity and improve the quality of the product under a deeper feeling of personal interest. By his diligence, care and economy, he can actually create an additional profit, which is to be used in supplementing regular wages. Profit sharing includes the payment of the best wages current, and promises a bonus beyond this, which, experience shows, the interested workman can invariably produce in good times.

Profit sharing as a principle may be applied in a large variety of ways, and it can be readily adapted to the great majority of productive and distributive enterprises. We invite applications for full information concerning the history and the results of the system as it is now in operation in many establishments, small and large, in Europe and the United States. The address of the secretary of our association is 25 Beacon street, Boston, Mass.

According to the reports gathered by the *Journal of Commerce*, the fire losses of the United States and Canada for the month of March show a gratifying decrease. They were in all $9,147,100, or over $2,000,000 less than those of February, and considerably below those of the corresponding month of 1892 and 1893.

THE LETTER BOX.

Some Electrical Questions.

From C. W. S., *Brooklyn, N. Y.*—Referring to those talks on electricity that appeared lately in *The Metal Worker*, there are some further points concerning which I seek for information and trust that you will be able to supply my wants.

1. Is there any difference between an induction and spark coil?
2. What kind of work are storage batteries most suited to?
3. Why are zincs in batteries amalgamated?
4. How can you tell when the battery needs recharging?
5. Does the carbon part of battery ever need renewing?
6. Is the battery wire on ordinary work heavier than the return wire? Also what sizes of wires are used for different kinds of work?
7. Is there a rule to tell the number of batteries required on different kinds of work?

Answer.—We have submitted the above questions to the author of the serial article on "Domestic Electrical Work," and he furnishes us the following answers:

1. Yes, the induction coil consists of a primary coil of coarse wire, surrounded by a secondary coil of very fine wire, and provided with an interrupter to break the primary circuit in rapid succession. The passage of a current through the primary coil induces currents having very high electromotive force in the secondary coil and will throw a spark across considerable space. This coil is used, for instance, to ignite blasting cartridges or for multiple gas lighting. The spark coil simply consists of what constitutes the primary part of an induction coil and is used for ordinary electric gas lighting.

2. Storage batteries are used for electric lighting and running motors. They are not capable of generating electrical energy, but are used simply to receive a current from some primary source and store it for use at a future time.

3. The amalgamation of zincs simply means coating their surface with mercury to protect the naked surface from what is known as local action. This wasteful action is the result of hard or soft spots in the zinc, and the waste is caused by little local currents being set up between them. By amalgamating the surface with mercury all these spots are connected together, thus preventing the formation of local currents.

4. The first intimation that a battery needed attention would be the weakening of the current or a milky appearance of the solution. If the latter, put in a new solution; if only a weakening of the current, examine the zinc, and if badly corroded renew it, or if in fairly good condition, it may only need a good scraping. If this does not improve the battery, renew the solution and zinc.

5. It does not.

6. In cases where but one battery and one return wire are used both may be of the same size, but in cases like hotel annunciator work where the battery wire may be called upon to furnish current to ring a number of bells at the same time, it is obvious that this wire should be larger than the return wires. It is customary to use No. 16 for battery and No. 18 for return wires in this class of work. In ordinary bell and gas lighting work No. 18 is used for both.

7. As a general rule the best results are obtained by connecting the battery in such a manner that the external and internal resistance are equal. In some cases, however, this will not be possible, and a combination must be chosen which will come nearest to these conditions. As, for instance, connecting the cells in series, multiple arc, or multiple series. Where the external resistance is great the battery should be connected in series in order to secure a great electromotive force; when the external resistance is small, connect the battery in multiple arc. If the total internal resistance of a battery connected in series is greater than the external resistance, the following combination should be adopted: Multiply the number of cells by the external resistance, divide this by the resistance of a single cell and take the square root of this quotient; this will give the number of cells to be connected in series.

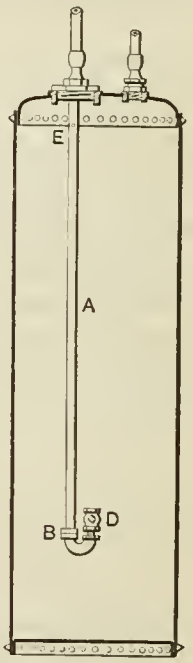
Wants a Rust Preventive.

From A. L. H., *Woburn, Mass.*—I would like a receipt for making some kind of a blacking to keep parlor stoves from rusting when they are stored for the summer. Can *The Metal Worker*, or some of its readers, supply it?

Answer.—Protection for cast iron stoves has been generally considered unnecessary, but for sheet iron stoves satisfaction has attended the use of a coating made of common beeswax dissolved in deodorized benzine. Just enough of the wax should be used to make a very light film on the iron to protect it from the condensation of the moisture in the air and not enough to interfere with blacking the stoves in the fall. It should be applied with a soft varnish brush. It must be kept in a tight vessel to prevent evaporation.

Safety Device for Boilers.

From H. W. W., *New York.*—I send a sketch which shows my idea for the prevention of accidents to kitchen boilers. The cold water pipe A has a short return bend on the lower end connected by a socket at B. The opening at the top of the boiler for the cold water pipe should be much larger than usual, to allow the bend to be inserted, and should be stopped by a reducing plug. On the return bend at D a check valve is placed and a hole is made in the supply pipe at E. This arrangement practically does away with



Safety Device for Boilers.

the expansion pipe which carries off so much heat and will also prevent explosions. When the pressure rises it will back through the hole at E into the main. The check valve will prevent the water being syphoned out of the boiler and steam can escape through the hole at E. I shall be glad to hear what the readers think of my arrangement.

Liability for Loans to Salesmen.

From E. M. W., *New York.*—Please publish your opinion as to the liability of a concern for money advanced to its representative. For illustration, an *attaché* of Sheet, Iron & Co. tells me he missed his remittance and asked the loan of funds until he shall receive the same. Do you consider Sheet, Iron & Co. liable for this?

Answer.—Our opinion is that "Sheet, Iron & Co." are not liable for the amount of the loan advanced to their representative. The power of borrowing money on the credit of an employer

for the personal benefit of an employee does not generally exist. And the fact that the money is borrowed for traveling or necessary expenses connected with the business of the employer makes no difference. It would be unwise and unsafe business policy to give a traveling representative a general power to bind his employer in this way. He might have received his remittance and lost it or gambled it away, and it would be a great hardship to compel his employer to pay the amount over again. The opportunities for fraud and collusion are infinite. If any such general liability obtained it would be easy to mulct the employer for a considerable sum. A salesman who feared he was about to be discharged could realize a very handsome amount by resorting to this method of involving his concern. A dishonest representative of a large house could in a single city apply to dozens of business men with whom his firm had dealings and obtain loans on the plea of "missing his remittance," and if the law sanctioned such a transaction his employers would be heavy losers in case the scheme was systematically worked. And it would not be difficult to do it. If the men applied to felt and knew that the law would compel the employer to make good the loan they would not hesitate if the house represented was a reputable and solvent concern. This is self evident. But it is a well-known fact that such advances are not made freely by business men to traveling salesmen. They are only made where there is a long acquaintance with the representative or where there is a feeling of personal trust in the salesman himself. Of course these loans are very frequent and common, but when they are made they are based upon the considerations mentioned. A business man would hesitate where such an application was made by a new and unknown salesman or one in whom he had lost confidence. Of course the lender has this security. He feels that his custom is valuable perhaps to the house represented by the borrower, and a threat of placing that custom elsewhere might and in many cases very likely would result in forcing the employer to sacrifice the amount of the advance rather than to lose his trade. But these are considerations of business policy and not of strict right. The law is clear, in our opinion. The loan is made to the salesman and he only is liable. His employers cannot be held. This is not merely an opinion. It has been so decided by the courts of New York in actual litigation, and we do not doubt that the same legal reasoning would be followed everywhere. There may be an exception in cases where the employer has permitted such loans to be made and has ratified them and made them good. This might create a custom with a particular concern on which they might have the right to rely. But these cases would be rare and the liability more or less doubtful even then. Of course, an express authority to the salesman to borrow money for his expenses would without question bind his firm. It would, however, be hard to prove, if the authority was denied on the actual trial of a case. We have considered the case of a traveling salesman, to which we presume our correspondent refers. He uses the words "representative" and "*attaché*." We can easily conceive that if the "representative" or "*attaché*" were the president or treasurer or other officer or the manager of the company or a member of a firm, the rule would be different. Such responsible officers and agents would in most cases have a right to make their principal liable for such loans contracted for the benefit of the principal and necessary for the transaction of the principal's business. But even then the principal would not usually be liable for loans made for the personal benefit of the borrower. It might raise a nice question, and if the amount was large the lender would inherit a lawsuit, the issue of which would be by no means certain.

Chimney Flues and Their Drafts.

From CRITIC, *New York.*—It is an axiom that two things exactly alike will act identically the same when the conditions are the same. This is true of the flues of a residence as of anything else, although many builders will dispute it. If built alike and situated and used in the same way, the results will be equally good in each one.

There are, however, many slight changes or oversights that may, unknown or unnoticed by the builder, serve as a complete ruination of the draft of a flue. For example, we have six houses, each with a single chimney and a single flue, the latter, however, with four openings—two on each floor. In four of the houses the draft is good and no trouble from soot is experienced, while in two soot has accumulated rapidly. In the first four direct draft stoves are used in each four rooms having openings to the flues. In the unfortunate two only two stoves with return drafts are used. The brick work is the same in all, so, evidently, the heating apparatus or its arrangement is at fault.

First examine the apparatus. Any check in the passage of the smoke and gas from any heating apparatus means a loss of heat to the smoke, and (here is the valuable point) is, of course, retained in the room or building. The loss of heat to the smoke and gas means an increase in weight. It is not so light as when hot, and there is less tendency for it to rise. This makes the draft sluggish, and the small particles of carbon and ash that give smoke its color are carried with greater difficulty and are to a much greater extent left in the flue as soot. This is one reason. Next, examine the arrangement of the openings to the flue. There are four in all the chimneys. And here it will not be amiss to say that never should there be a flue with more than one fire place, and it is best never to have more than one opening of any kind below the roof. In the "good" flues each opening is filled with an inflow of warm air and smoke, and each helps the draft of the others. In the "poor" flues two openings admit fairly warm smoke, while the others leak in cold or cool air, the latter not only not helping the draft but seriously injuring the movement by chilling the air that otherwise would rise because it was warm. Thus, where at first glance the conditions are the same and results dissimilar, we find on examination that the things themselves are quite different.

Leaving the example taken, it may be suggested that a flue on the inside of a residence will burn better than one in an outer wall, and, quite as important, will give a far larger amount of heat to the building. If a flue is placed on the outside it should have 8 inches of brick work on the exposed side, all the way to the cornice. The interior walls of a flue should not be over 4 inches, as here the escape of heat from the smoke means the gain of warmth in the house. Tight brick work is absolutely necessary for a good draft, and it is better, if the surface is plastered, to coat the outside rather than the inside. A flue circular in cross section is the best, and the shape nearest approaching this is most desirable. A square is, therefore, the best shape for ordinary brick work, being 8 x 8 inches for the usual fire place or range. Triangular flues are the worst a builder can conveniently make. They have over four-fifths the wall area, which means proportional loss of heat and proportional loss of speed, while their cross area is only half. Besides, the sharp angles offer additional friction, and so the resistance is even more than that of the square flue, while the volume is only half.

The man who builds a straight flue of good brick work above the top of the house and who has but a single opening to each flue need have no fear as to the results, provided his neighbors do not interfere.

Can Top Wanted.

From J. G. BLAKELY & CO., *Grand Rapids, Mich.*—Can any of your readers inform us who manufactures a can screw top, in which when the top is pressed down with the thumb the oil flows into the lamp and when the thumb is released the oil ceases to flow? These tops are on the market and are manufactured by some one in the United States, we think.

Hanging Gutters.

The following entertaining letter comes from a Montana correspondent who was asked to give his method of hanging long gutters:

If there is anything that I know less about than another it is gutter hanging. Have done a few jobs, however, and always had good luck. Never had a job blow down. Always used the old tin strips. The proposition you suggest of a barn 80 feet long would depend some on circumstances, lay of ground for drainage and how many down spouts we could work on the "old man." There are very few buildings in this country with gutters outside the towns; that is, the business houses with flat roofs, and they would be better without them as they fill up with ice and back up the water 6 inches deep at times.

The Indiana Board of Health has ordered the vaccination of all tramps found in the State.

The Vermont Slate Industry.

In a recent issue the Troy *Times* gave a very interesting description of the typical Vermont village of Fair Haven, illustrated by excellent engravings. From this article we extract the following account of the important slate quarrying industry for which that locality is famous:

The principal industry of Fair Haven is the quarrying and working of slate, the town being the slate center of Vermont, the State ranking second to Pennsylvania in the quantity of slate produced and second to none in the quality. In the hills about the town are some of the choicest veins of slate in the world, and it is estimated that no community has a larger number of quarries within its borders. Everywhere is seen the impress of quarrying. Derricks and lofty lifting cranes are almost everywhere noticed. Nearly all colors of slate are quarried, the principal being green, reddish brown, chocolate, "slate," mottled, bright red and bluish gray. The product is worked into every conceivable article for which slate may be used. Roofing and tiling slate are most produced, but slate for marbleizing and conversion into mantels, billiard beds, slabs, tanks and a score of other uses is also quarried.

The quarrying of slate in Western Vermont was commenced in 1839 by Alanson Allen and Caleb B. Ranney. The first quarries were for securing school slates, but the product did not meet the requirements for this use, being too hard, and in 1847 the first slate for roofing purposes was quarried. This is said to have been used on a house at Whitehall. The business continued to develop, until now it is a leading industry of Vermont and New England. Among the pioneers in the marbleizing of slate were Ryland Hanger and James Coulman, the latter being a member of the present firm of Coulman & Wescott. Mr. Coulman first began marbleizing slate in 1859 and has almost continuously been engaged in the business until the present time. Coulman & Wescott do a large business, the firm being formed in 1881. The firm employ about 50 men when operating in full, the wares including nearly every article into which slate is converted. Both members of the firm are practical slate workers. The firm own a quarry which produces a superior quality of green slate. Mr. Coulman is, perhaps, the oldest manufacturer still actively engaged in the slate business in the country.

Another old and influential firm are the Hazard Slate Company, established originally in 1852, when the manufacture of slate was instituted. They are pioneers in the slate trade. For several years prior to the establishment of the firm in Fair Haven S. L. Hazard, secretary and treasurer and general manager, was connected with a similar enterprise at West Castleton. The plant is in Fair Haven, and is one of the largest and most fully equipped in the village. The company own an extensive quarry and manufacture nearly every variety of mill slate goods. Mr. Hazard is a manufacturer of large experience, and holds a high position among the slate manufacturers of the State. W. F. Parker is president of the company. In addition to his connection with the Hazard Slate Company Mr. Hazard is the proprietor of the Lake Shore Slate Company of West Castleton. He brings many years of active experience into every enterprise with which he is connected, and is a power in all important slate transactions.

No concern of Fair Haven has a more extensive business and acquaintance than the Fair Haven Marble & Marbleized Slate Company, who beyond question are entitled to a place at the head of the slate industry. The house has a history dating since 1859, when it was established as Hanger & Coulman. The present designation dates from 1866, when the company were organized. The company own valuable quarries covering 22 acres, and the works along the Castleton River embrace two large factories, covering 2 acres. There are large yards for storage purposes, and the mills are equipped with the most nearly perfect appliances used in slate manufacture. Water and steam are both used to operate the works. The company manufacture everything made from slate. The products are both marbleized and unmarbleized, every article being of superior design and workmanship. The company have recently brought out imitations of most of the modern decorative marbles, such as Mexican onyx, Numidian onyx and several other varieties equally attractive. These are produced in marvelously close imitation of the most rare and costly marbles. The firm are also introducing a line of beautiful and artistic church altars. The firm have the contract for the wainscoting of the church of St. Paul the Apostle, on Fifty-ninth street, New York City, and will also place an altar in the church. Charles R. Allen is president of the company, G. H. Shinville is secretary and treasurer, and E. L Allen is general manager. E. L Allen is a native of Hartford, N. Y. He was a representative from Fair Haven in the State Legislature in 1880, and in 1890 was a candidate for Governor of the State on the Prohibition ticket. All the gentlemen composing the company are exceptionally talented business men.

The Valley Slate Company are another important concern, having been established in 1883 as successors to the long continued business of R. E. Lloyd & Co. R. E. Lloyd, the treasurer, and virtually the proprietor of the business, was one of the founders of the firm of Lloyd, Williams & Co., and is one of the foremost men in the slate industry in Vermont. The quality of the slate produced by the company's quarries is known as unfading green, and has a large sale in all parts of the country. Mr. Lloyd is also a member of the firm of Lloyd & Jones. This latter firm operate a quarry adjoining the quarry of the Valley Slate Company. Both quarries are 3 miles south of the village of Fair Haven, and about 35 men are employed. Mr. Lloyd is engaged in the erection of a block on Main street, Fair Haven, to replace the block burned in January, 1893. The new block is 90 x 25½ feet and three stories in hight. The block will be finished in the spring.

Prominently representative among the slate quarries of Vermont is that of S. Allen & Co. The business was founded in 1868 by S. Allen, and has always enjoyed confidence and patronage of a most substantial nature. The works are near the depot, and combine a mill, with dimensions of 100 x 50 feet, and an office and yards. About 30 men are employed. The company manufacture nearly every variety of slate products, the wares being of first quality. R. C. Colburn is associated with Mr. Allen in the company. Both are experienced slatemen.

The Riverside Slate Company, manufacturers of milled slate stock, are another prominent firm. The company include A. H. Merriam, president; B. Merriam, treasurer, and W. K. Merriam, secretary. The works are near the depot. The company manufacture every variety of slate products except roofing slate, and are recognized as one of the substantial firms of the town.

Maley Brothers, manufacturers of marbleized slate mantels, are acquiring a good reputation as dealers of business integrity and promise. The firm are composed of J. Maley and M. K. Maley, who are rising men. They employ about 15 men, and the trade is constantly increasing.

Griffith, Owen & Co., slate manufacturers, whose works are known as the Scotch Hill Slate Works, are prominent dealers. The firm's quarry is about 2 miles from the village of Fair Haven, where is a mill 50 x 100 feet in size, which has four circular saws to prepare slate for marbleizing. The members of the firm are natives of Wales, and they manufacture a most attractive line of mantels and other marbleized products, all of which command the best prices.

One of the best equipped quarries in Western Vermont is the Eureka Quarry, about three miles south of the village. The quarries give employment to about 125 men. A. Tuttle, who is one of the promoters of the plan for adapting the power of the Castleton River, through the dam at Carver's Falls, is one of the proprietors of the quarries. He is one of the best informed quarrymen in the State. The products of his quarries are used in roofing, and find the greatest sale, shipments being made to London, Australia and Mexico. The shade of the slate is attractive and much sought.

Another old slate business in the vicinity is that of the Billings Slate & Marble Company, whose marble slate mill is at Hydeville, and whose quarries are near that place. The business was organized in 1854 and reorganized in 1876. C. W. Billings of Troy is president, and C. W. Tennant treasurer and general manager. The company have a capital of $50,000 and employ about 30 men. The company manufacture slate mantels in all varieties for architectural uses. The mill secures power from Lake Bomoseen. Mr. Billings has long been identified with the slate industry, and is a capable business man. Mr. Tennant, upon whom has devolved the immediate supervision of the works, is familiar with every detail of the manufacture and sale of slate products. He is a former resident of Troy, N. Y.

Near the above works are the plants of R Hanger, who makes a variety of products, and Bolger Brothers, who operate mills and quarries.

The Foundry Slate Company and McDonough & O'Day, other firms in this locality, produce slate mantels.

E. D. Humphrey quarries purple roofing of a superior quality, and Williams, Pierce & Hughes quarry purple slate for milling purposes, both firms having good veins and producing desirable material.

Jacob Warner, whose works are in Fair Haven, near the depot, established his business about ten years ago. He manufactures marble and granite products.

William H. Pelkey, formerly Pelkey Brothers, conducts electric slate works and a foundry for castings.

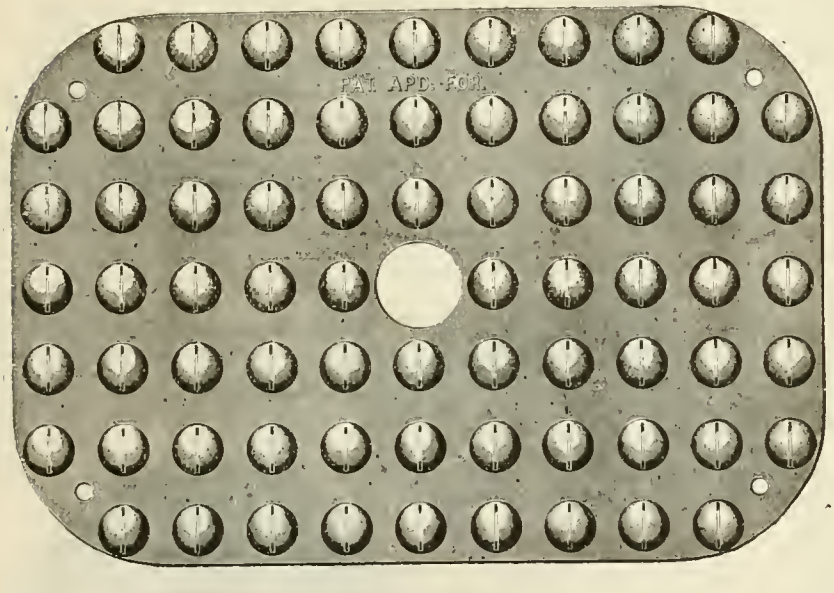
The William E. Lloyd Slate Company have some of the most extensive slate quarries in Fair Haven. The quarries are below the Eureka Quarries, and produce both purple and green slate. About 100 men are employed.

The quarries have a large capacity and are thoroughly worked. Mr. Lloyd has been continuously engaged in quarrying slate since 1865. His quarries produce roofing slate. He is successor to Lloyd, Owens & Co., his partners in that firm having been his brother, R. E. Lloyd, and Owen Owens. Mr. Lloyd has his son, William H. Lloyd, associated with him in the present enterprise.

Other slate manufacturers of Fair Haven are Minogue & Greer, H. H. Matthews, Robert Jones & Co, William Francis & Co., Roberts & Owen, Bennett & Felt, Minogue & Durick, James McNamara, St. Louis & Young and the Bonville Slate Company, all of whom do a good business during the season of activity in the slate industry.

A New Vapor Stove Burner.

The Michigan Vapor Stove Company of Grand Rapids, Mich., are using a new burner on their stoves, which is herewith illustrated. It is styled a "jet cone" burner. Each aperture as shown furnishes a jet of flame. The burner



A New Vapor Stove Burner.

shown is used on their 60 and 61 step stoves and has 72 jets. Round burners of the same description are used for the cooking holes. The 7-inch burner has 44 jets and the 5-inch burner has 21 jets. The company manufacture a full line of generator stoves, including step stoves, square tops, high juniors and juniors with single generators or individual burners.

The Naval Board that has been investigating the feasibility of converting the whaleback type of vessel into an auxiliary cruiser for war purposes has reported to the Department that these vessels are unsuited to the purposes of warfare on account of the impossibility of mounting heavy ordnance on board of them. The inventor and builder of the whaleback ships believed that it was possible to convert them into formidable coast defense vessels in time of war, but it is shown that only light rapid fire or machine guns could be carried on account of their light construction and limited deck space.

During last year 27,547 vessels entered and cleared at Canadian ports, as against 30,961 in 1892 and 31,321 in 1891. The total tonnage, however, last year was but little less than that of 1892, which was the highest in the history of the Dominion. It was 10,608,611 tons. A growing tendency is noted toward the construction of larger vessels every year. The number of vessels built in Canada in 1893 was 313, an increase of 35 over the previous year. As evidence of the decline in shipping values, however, it is noted that their average selling price has fallen from $37 per ton in 1868 to $11.50 per ton in 1893.

Utilization of Garbage.

The subject of the utilization of town refuse has been referred to from time to time in these columns, and it is one which is attracting an increased amount of attention in this country. In several cities of the United States there have been established various forms of crematories and destructors for garbage, but hitherto this material has not been turned to any very profitable account, as is the case in several European cities. The following details respecting the Livet process of utilizing city refuse will, therefore, be found interesting. This process is being favorably regarded in Europe, where it has been adopted in several quarters:

The Livet Process.

The Livet apparatus, as described by English journals, involves the rapid and economical generation of heat in furnaces and the utilization of dust and refuse for electric lighting. There is no novelty about the special objects of this process, which are: 1, The disposal of solid town refuse, whether wet or dry, by burning. 2, The utilization or the conversion of the products of the combustion of the said refuse into steam. 3, The employment of the steam so generated for electric lighting, for pumping sewage and for a variety of other purposes. 4, The manufacture of a kind of cement or mortar out of the residue or by-products of combustion, or the use of them, in combination with tar or bitumen, for footpaths and sidewalks, or the employment of the clinker for the foundation or bottoming of ordinary roads. The special feature of this furnace is that the form of the flues is such as will utilize the increasing weight of the products of combustion or gases as they travel toward the chimney, promote a high velocity of the air passing through the furnace bars, produce a rapid combustion with intense heat, and cause the gases themselves to pass sufficiently slowly through the flues to part with all their useful heat before they escape into the atmosphere.

English Methods.

The process is greatly facilitated by the fact that the solid refuse of English cities contains about 80 per cent. of mixed cinders and ashes, and thus provides in a great degree the materials for its own ignition and combustion. The method adopted in English cities is to deliver the refuse free of charge at the furnace mouth in a raw state, and shovel feed it into the fire without any preliminary drying, shifting or screening, an important point in the process. There is no unpleasant odor, as the high temperature and great force of draft secure complete combustion. The average quantity of rubbish burned per hour per square foot of grate surface of the Livet generator is 33 pounds, and 4 pounds of water is evaporated per pound of rubbish containing 20 per cent. of moisture. There is an excellent arrangement by which the flues are kept perfectly free and unclogged, even after months of use; the progression of the gases is partially arrested at the end of each flue, and the objectionable light dust is deposited in suitable expansion chambers or pits, which can be cleaned out as required.

Production of Electricity.

The value to a city of an effective apparatus for refuse utilization is shown in the recent installation at Halifax, England, which is equal to the production of current for the supply of 10,000 incandescent lamps of 10 candle-power for six hours a day, when 3000 tons or one-third of the rubbish of the city is burned. If the capacity of the plant were equal to burning all the rubbish produced, one lamp to each inhabitant could be supplied for three and a half hours daily.

While Coxey and others are marching on Washington with their hosts of "the unemployed," the farmers in the Eastern part of the country are crying out for more help, and the Free Immigrant Labor Bureau in New York announces that it is unable to meet the demands upon it for laborers. In the West, too, a similar condition of things prevails; prices for farm labor are higher than ever and the supply is inadequate.

The *Hungarian Metal Worker* says that an extraordinarily tough luting for pipes which have to stand pressure is made by mixing five parts of Paris white, five of ocher, ten of litharge, five of red lead and four of black oxide of manganese, very thoroughly together, and then adding a little asbestos and boiling oil.

The Canadian Minister of Public Works has entered into an agreement with the contractors by which they will complete the new Canadian Canal at Saulte Ste. Marie by July 1, 1894, for an additional grant of money.

Less cotton is being planted this year in the South, but more attention is being paid to cereals and other food products.

THE RETAIL STORE.

Stove Repair Orders.

Murphy, Maclay & Co., Great Falls, Mont., write as follows concerning the question of stove repair orders: "We have recently noticed letters from readers of the paper giving their systems of keeping account of stove repair orders. We have been using blanks similar to the inclosed, which have proven entirely satisfactory. We give the blank to the customer to fill out, requiring a partial payment in advance of ordering, so that the customer will be sure to call for the repairs when ready. The blank is self explanatory. We order from it and file it away until the repairs are received. On receipt of the castings we tag them, stating the name and number of the stove, the name of the person ordering and promptly notify the customer by mail that we have received his repairs. In this way we have done a large trade in stove repairs without loss of any kind."

The blank inclosed by our correspondent is given below:

MURPHY, MACLAY & CO.,
GREAT FALLS.

Order for Stove Repairs.

For Mr.....

We require a part payment in advance before ordering repairs. No exception to this rule.

READ OTHER SIDE BEFORE FILLING.

Null Name of Stove or Range.....
Full Number " " .....
Year Stove was Made.....
Latest Date of Patents.....
Is it a Coal or Wood Stove.....
Is it a Reservoir or Square Stove .....
Name and Address of Manufacturers .....

Repairs Wanted .....

COST OF REPAIRS SHIPPED BY FREIGHT.

	Per lb		Per lb.
5 lbs. and over	$0.18	35 lbs. and over	$0.14
10 " " ..	.17	50 " "	.13
15 " " ..	.16	75 " "	.12½
20 " " ..	.15	100 " "	.12

These prices are for common castings and do not include nickel plated parts.

DO NOT WRITE IN THIS SPACE.

Date Ordered ..... Date Received.....
By Freight or Express.....
Of Whom .....
Weight of Castings..... Cost.....
Charges .....
Amount Paid. ..... Date.....
Due .....

It will be noticed that in one place the suggestion is made "Read the other side before filling." The matter on the opposite side of the blank consists of directions to be followed in ordering stove repairs; also of a broken view of a cook stove with all the plates numbered and the correct name of the parts given in tabular form below the cut.

Nested Stove Pipe.

The accompanying cuts show a nested stove pipe which Ruth, Patterson & Ruth, Alliance, Ohio, are manufacturing and marketing. The object of the invention is to devise a construction of joint which will be simple and economical in cost, readily packed into a small compass for storing and especially shipping, and put together without riveting or beating the seams. The end of one joint forms a band and encompasses the end of the adjacent joint and prevents its spreading, while the seam is so formed that the joint will not give inward. The seam is formed by slipping the right edge into the groove on the left, and held in place by a rivet at the bottom. It will be seen that the lower end of each joint is the only part secured, and when put together, the upper end is slipped into the lower end of the joint above, thus forming a tight joint, as shown in Fig. 1, which can be easily taken apart and put together. Fig. 2 is an end view and shows construction of seam. Fig. 3 shows the upper end spread and nested for storing in shop or domestic use, the advantage of which is at once apparent when storing the pipe during the warm season, as a number of joints can be packed into a space not much larger than that usually occupied by one. Fig. 4 shows the pipe packed for shipment, and for this special advantages are claimed. It is pointed out that ordinary stove pipe is shipped as double first-class freight, while this is rolled and wrapped in paper and is shipped as fourth class and in car lots as fifth class. The pipe is made in the usual sizes.

Nested Stove Pipe.—Fig 1.—Finished Joint.

Fig. 2.—End View of Joint.

Fig. 3.—Pipe Spread and Nested.

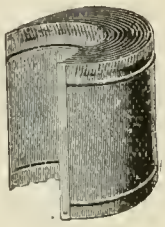
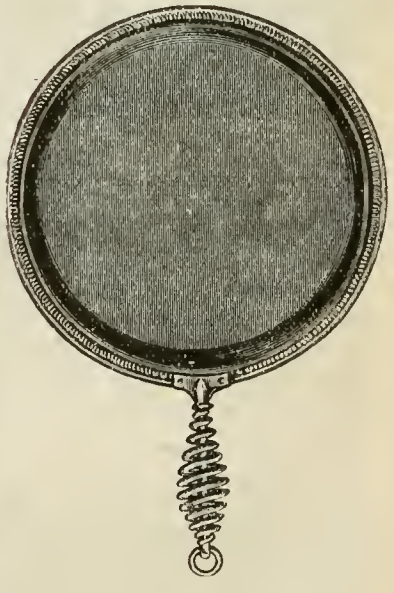


Fig. 4.—Pipe Packed for Shipment.

Crown Asbestos Griddle.

Hall & Carpenter, Philadelphia, Pa., are introducing the Crown asbestos griddle, as here shown. It consists of a sheet of asbestos covered with a circular sheet of steel, which has a single bead around the outer edge, the whole held together by a corrugated tin rim, crimped on so as to hold both firmly together. The handle is of wire, nickeled. The griddle is 9 inches in diameter, and is suitable for a number of purposes where the quantity required is not large, such as frying eggs, mush, hominy, cakes, &c. The placing of asbestos between the fire and metal prevents burning or scorching.



Crown Asbestos Griddle.

Relief Wringers.

The accompanying cuts represent two iron frame wringers offered by the American Wringer Company, 99 Chambers street, New York. The metal part of the wringer, Fig. 1, is all of wrought and malleable iron, galvanized, and the japanned springs are directly over the bearings. The upper arms are each provided with a pin which fits into an opening in the lower arm, with a heavy rubber gasket between the arms at the pin ends to relieve the strain. The clamps are of the swing pattern, allowing adjustment to round or straight surfaces. The wringer shown in Fig. 2 is of the same construction as the former, but in addition is provided with cog wheels. The manufacturers state that by the use of the thumb nuts and spiral springs the pressure can be adjusted quickly for either heavy or light work, preventing the rolls from being overstrained, and increasing the wear of the machine over that of the ordinary iron frame wringer.

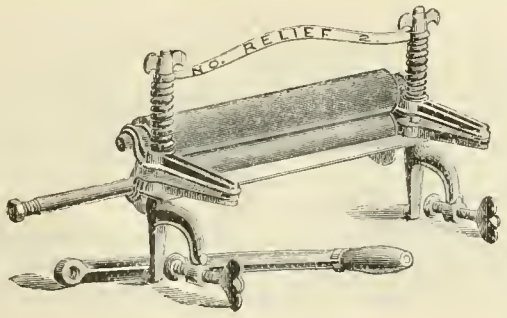


Fig. 1.—Relief Wringer.

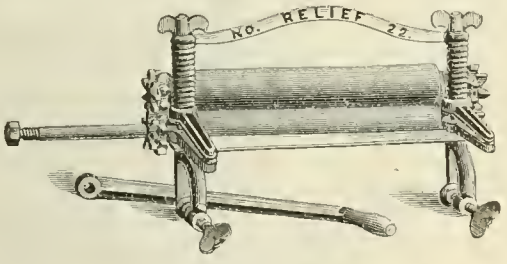
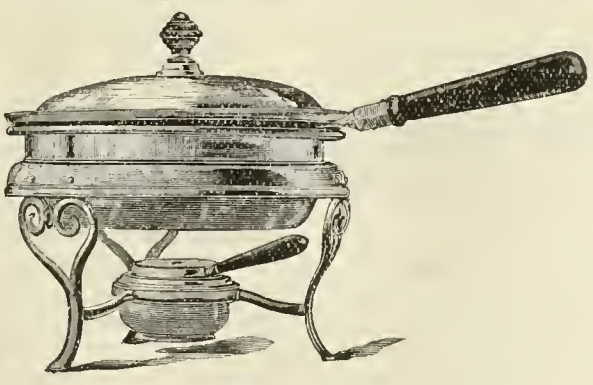


Fig. 2.—Relief Wringer with Cog Wheels.

Aluminum Chafing Dish.

The Wohler Aluminum Company, 65 Jackson street, Chicago, have just placed on the market an aluminum chafing dish, herewith illustrated. There are a number of peculiar properties of aluminum which render the metal peculiarly well fitted for purposes of this character. The metal is not affected by either heat or acids and yet is an admirable conductor of heat. The heat conductivity of the metal used in making a chafing dish is an important consideration, as the fuel used is alcohol, and the claim is made that cooking can be done in an aluminum chafing dish with about two-thirds as much fuel as would be required for some of the heavy plated dishes. The purity of the metal is another important consideration, as any kind of food can be cooked in such a dish with no danger of contamination. The chafing dish is made wholly of aluminum except the handles, which are of wood, as usual. No solder is used, and the parts are therefore indestructible. The dish is made either highly polished or satin finished, closely resembling silver plate or solid silver, while it costs about the same as silver plate. The same company will soon place on the market a highly finished and elaborate tea pot, which they say will be the first to be made in aluminum in this country. It will be made with polished aluminum spout and handle. About the same time they will bring out an aluminum rice boiler, for which the patterns are already made.



Aluminum Chafing Dish.

The Philadelphia *Record* publishes a list of 25 "tramp" steamers which were obliged to leave that port in ballast during the first ten weeks of this year owing to inability to secure cargoes.

The Ellis Warming Box.

J. T. Ellis, manager, box 262, Newark, N. J., is offering a warming box as illustrated herewith. The box, as shown without the cover by a two-thirds sized cut in Fig. 1, is entirely of metal with an opening in the center 1⅝ inches in diameter. The bottom of the box is solid and the air space between the inside and outside walls is covered by a brass rim. The inside wall is of fine brass wire cloth, and the outside wall of perforated metal. The heat is supplied by checker shaped carbon with a hole in the center, which is placed on a pin in the center of the opening. This is lighted with a match, after which the cover is put on the box, having lugs for holding it securely in place. Air is provided through the openings in the walls or sides of the box to allow of slow combustion; one carbon, it is stated, giving heat for about two hours. Fig. 2 represents the box in a ring or handle, which allows of handling the box when heated. The box is designed for relieving pain by the application of heat in a more convenient form than hot water bags, bricks, &c.; to be used in case of earache, neuralgia, toothache, lumbago, rheumatism, colic, &c. The point is made that the box may also be used to advantage for keeping warm the hands of street car drivers, conductors, policemen, coachmen, teamsters, postmen, mechanics, farmers, school children, also ladies when shopping, calling, walking or driving. The box with rim measures 3½ inches in diameter, weighs 5½ ounces and is finished in nickel plate. The manufacturer claims that the heater burns freely in the pocket or other receptacle without flame, smoke or unpleasant odor when closed. Twelve carbons accompany each heater and additional carbons are packed 100 in a box.

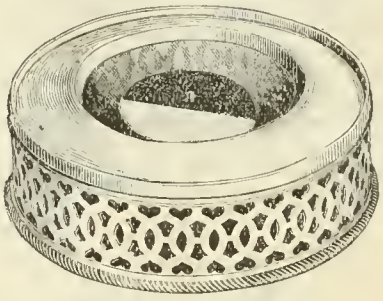


Fig. 1.—The Ellis Warming Box.

Fig. 2.—Warming Box in Ring.

Thomas A. Edison and Col. E. Gouraud have applied to the Court of Chancery, Newark, N. J., for the appointment of a receiver for the Edison United Phonograph Company. The bill claims that the directors of the corporation have pursued a policy contrary to the views of the holders of one-half of the company's stock, which has resulted in the wasteful and injurious operation of the concern and caused its insolvency.

STEAM AND HOT WATER.

The Ideal Water Heater.

We show in the accompanying illustrations a general and a sectional view of the Ideal water heater manufactured by the Ideal Boiler Company, Chicago, Ill., with temporary office at 88 Lake street, from where they will remove to 36 Dearborn street on May 1. The sectional view, Fig. 2, shows the interior water sections and the course of the circulation, while Fig. 1 shows the exterior form of the boiler, the method of connecting the sections, the position of the clean out doors, &c. Particular emphasis is laid upon the circulation of this heater. The water, it will be observed, enters on a level with the grate in the bottom section, flows around the fire pot and then enters a water column which communicates with the horizontal sections. These sections have the smoke holes staggered, so as to bring the products of combustion in more efficient contact with the surfaces. Each section is independent of the others and the manufacturers say is practically a separate boiler, so that when only a light fire is maintained the heated water rises directly to the flow pipe. The smoke flues in each section equal in area the opening for the smoke pipe. The hollow fire pot as shown in Fig. 2 is corrugated on its inner surface, and is furthermore slightly tapering in form, the grate diameter being larger than it is above, this shape, it is claimed, giving the most perfect combustion. The sections are fastened together by short bolts on the outside and the meeting surfaces are machine milled and made perfectly true. The only water joints are those which connect the sections together at opposite sides. It is pointed out that, if it is desired to increase the capacity of the boiler, other sections can be added. Furthermore, in case of accident, any section can be removed without difficulty.

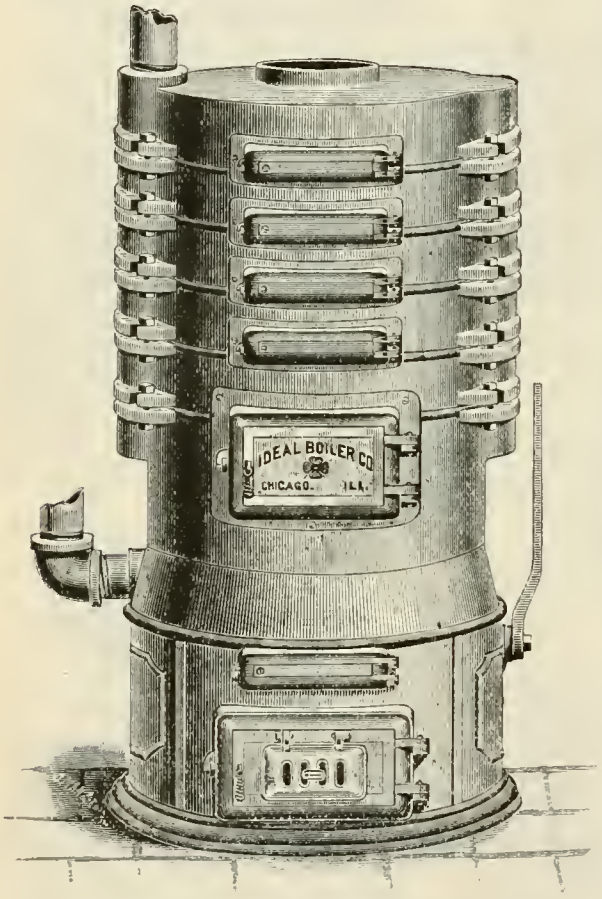


Fig. 1.—General View of Boiler.

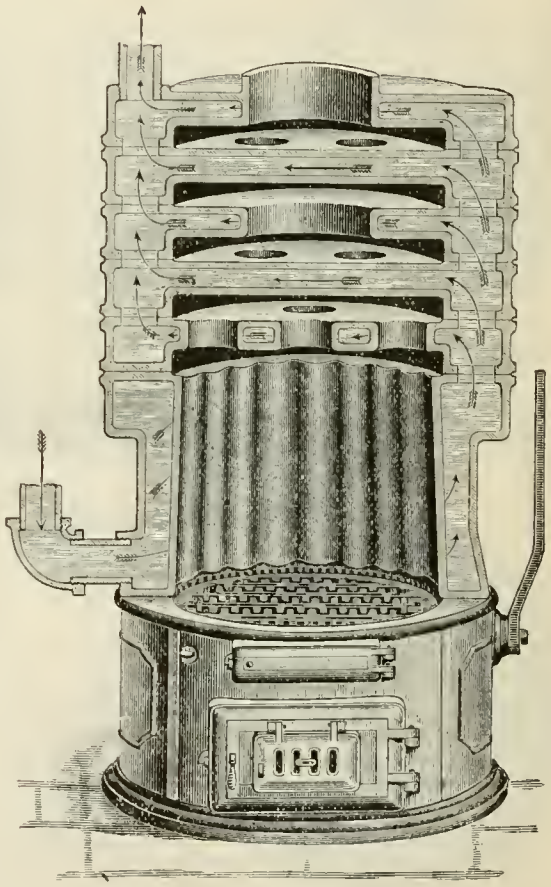


Fig. 2.—Sectional View.

THE IDEAL WATER HEATER.

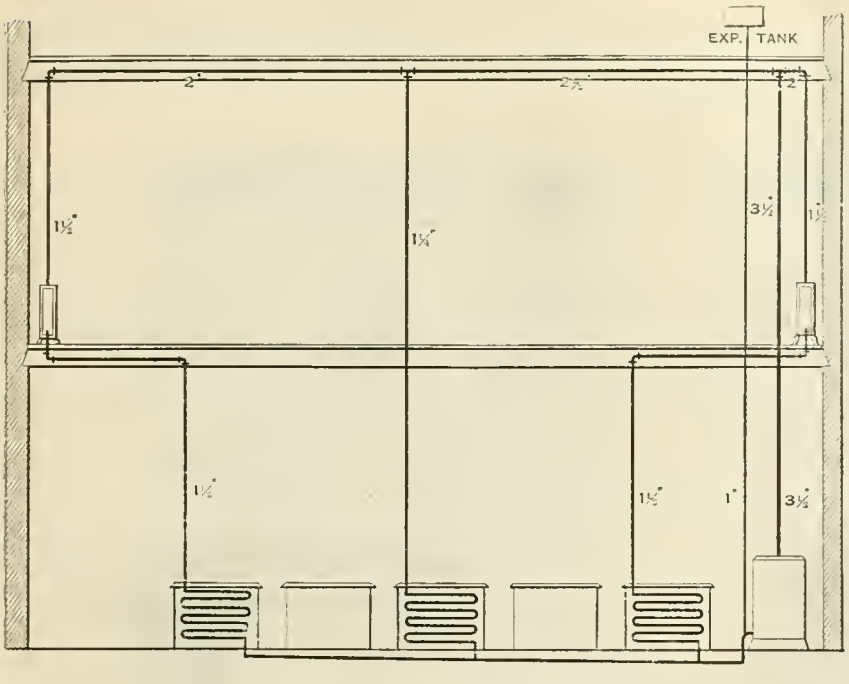
Radiation for Theater.

From MANAGER, *Nashville, Tenn.*—I have a theater to heat that seats on first floor 376 people, second floor 324 people and gallery 340 people. The stage has a very high ceiling and will be very hard to heat, and if it should be lacking in radiation when the curtain is raised a draft of cold air is thrown into the auditorium, making it very uncomfortable for the audience. We should allow something for animal heat in auditorium, taking an average house as a basis to figure from. I have had a great deal of trouble in getting the right amount of radiation in stage and auditorium, and would be glad for you to tell me through the columns of your excellent paper how strong to figure it. The building is to be heated with hot water.

Note.—Some of our readers have had experience in this line of work and we hope they will give the rules they have used. On consulting a number of engineers there is a similarity of opinion that each case requires different handling, and with direct radiation there is more difficulty in avoiding air currents than with an indirect system. There is less probability of air currents if the same radiation is used, in proportion to the space, back of the curtain as in front of it. In the locality from which the inquiry comes it is probable that with hot water 1 square foot of surface would be sufficient for 200 cubic feet of space. The radiation used back of the curtain is preferably arranged along the outer walls.

Wants a Heating System.

From W. A. T., *Buffalo, N. Y.*—If our Tennessee friend who asks for a heating system in *The Metal Worker*, March 10, had given a plan of his 22 x 125 feet dry goods store, less difficulty would be encountered in assisting him. I give a plan of a supposed store and a method of installing a hot water plant for heating it. As the expense of a basement is to be avoided, the boiler must set on the first floor unless there is space behind the store to erect a building to set it in, which would but slightly change the general arrangement shown in Fig. 1, and would not interfere with the operation. As the upper floor will be more easily heated, 1 square foot of heating surface will be sufficient for 70 cubic feet of space, as the piping aids in heating. On the first floor 1 square foot of surface is used to 50 cubic feet of space, as the water in four of the radiators will pass through the upper radiators before reaching them. On the upper floor the surface has been placed in four radiators of 100 feet each, two at the front and two at the back of the building, as shown in Fig. 2. On the lower floor six coils of 100 feet each are placed in front of the counters, one on each side of the store, at the front, middle and back, as shown in Fig. 3. The radiators in the middle of the store are fed with a pipe direct from the main, but the front and back radiators are fed by the return from the upper radiators. The floor of the store will have to be taken up to run the return, and all of the branches should be connected to it with Y fittings. The return should have a fall all the way to the boiler, then rise and connect with it. The highest point in the system should be where the rising flow main branches, and an air valve should be placed there, and from this point there should be a slight fall in all the pipes to let the water as it cools fall back to the boiler. A pipe should be connected with the return at the boiler and run up to the expansion tank located above the top of the flow main, and in the space above the second-story ceiling if there is room. Another method of heating the lower floor would be to arrange the coils on the ceiling, which would avoid running the return under the floor, but as the greatest heat would be on the heads of the clerks and customers it is doubtful if such a labor saving plan would be advisable.



Wants Suggestions on Heating.—Fig. 1.—Showing General Arrangement.

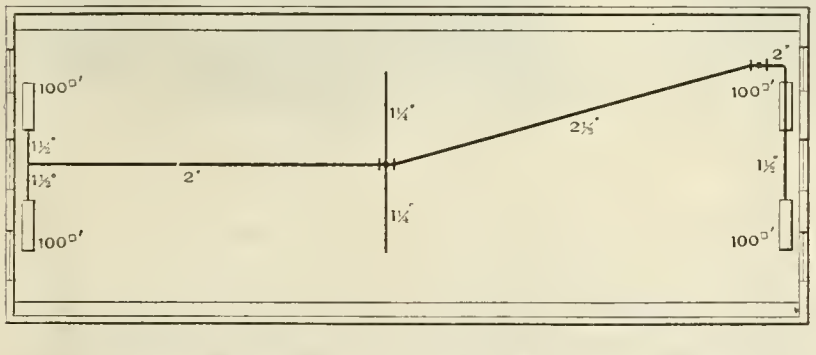


Fig. 2.—Plan of Second Floor, with Flow Main and Radiators.

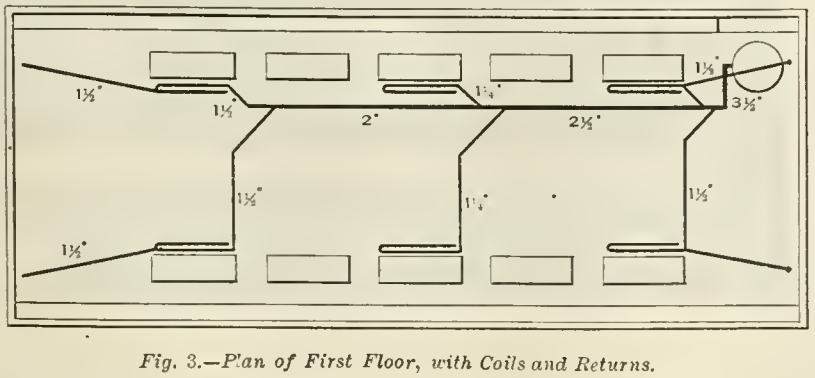


Fig. 3.—Plan of First Floor, with Coils and Returns.

Automatic Pump Governors.

In *The Metal Worker*, March 24, was an article entitled "The Value of Exhaust Steam for Heating," which described a system of returning the water of condensation to the boiler by means of a steam pump and an automatic pump governor. After the publication of the article we were informed that the essential feature of the system, which was the automatic pump governor, was controlled by patents owned by the Albany Steam Trap Company, Albany, N. Y., who had licensed Timothy Kieley, 7 to 11 West Thirteenth street, New York, to manufacture the governors, and that litigation was now in progress with other manufacturers. We quote as follows from a letter received from the Albany Steam Trap Company in reply to our inquiry respecting their interest in the patents and system:

The pump governor or regulator is the main feature of the system you described in the article in *The Metal Worker*, March 24. There are several parties making these devices, and as we believe in violation of our patented rights, as we are the owners of the patents numbered 207,483 and 207,485 fully covering the automatic regulation of steam pumps for returning the water of condensation from steam heating systems under pressure. We have a suit against the Worthington Pump Company, claiming that they infringe the claims in the patents above named. We have licensed Timothy Kieley of your city to manufacture pump governors under our patents. All other manufacturers of pump governors controlled and operated by the condensed water of the heating systems we claim are infringing our patents.

T. C. Joy & Co., Titusville, Pa., manufacturers of the Joy flue radiators, with offices at 48 Centre street, New York, and 96 Lake street, Chicago, are sending out a circular with a list of the large buildings, with the names of the architects and heating engineers, where their radiators are used. Two carloads of radiators were recently received for the Manhattan Life Insurance Company building, in which Gillis & Geoghan are installing the heating plant.

R. T. Crane of the Crane Company, Chicago, has been superintending some of the transfers connected with the purchase of Huntington-Hopkins Company stock of pipe and fittings at San Francisco, Cal.

Scollay's Improved Boiler.

The accompanying illustrations show the improved hot water boiler being placed on the market by John A. Scollay, 74 and 76 Myrtle avenue, Brooklyn, N. Y. Fig. 1 shows the complete boiler, and Fig. 2 is a sectional view showing the internal arrangement. It has a labor saving grate and the lower fire pot is lined with fire brick. Above these is the water chamber, or dome, with an inner chamber directly over the fire which has both corrugated surface and projecting tapering studs to increase its efficiency as a heat absorbent. The inner chamber connects with the outer chamber both at the sides and at the top. The flow and return main connections are at the top and bottom of the boiler. A draw off cock is placed at the bottom to empty the boiler. The boiler proper has an outer non-conducting casing with a casing ring so made and placed as to form a baffle plate to cause an indirect draft. There is a smoke outlet at the back connecting with the boiler both at the top and at the bottom, and when the damper at the top is open there is a direct draft, but when it is closed there is a full reversed indirect draft. The boiler is known as the C series and is made in four sizes rated to carry from 250 to 1000 feet of radiation. Some of these boilers have been used for both residence and greenhouse heating during the winter with satisfactory results.

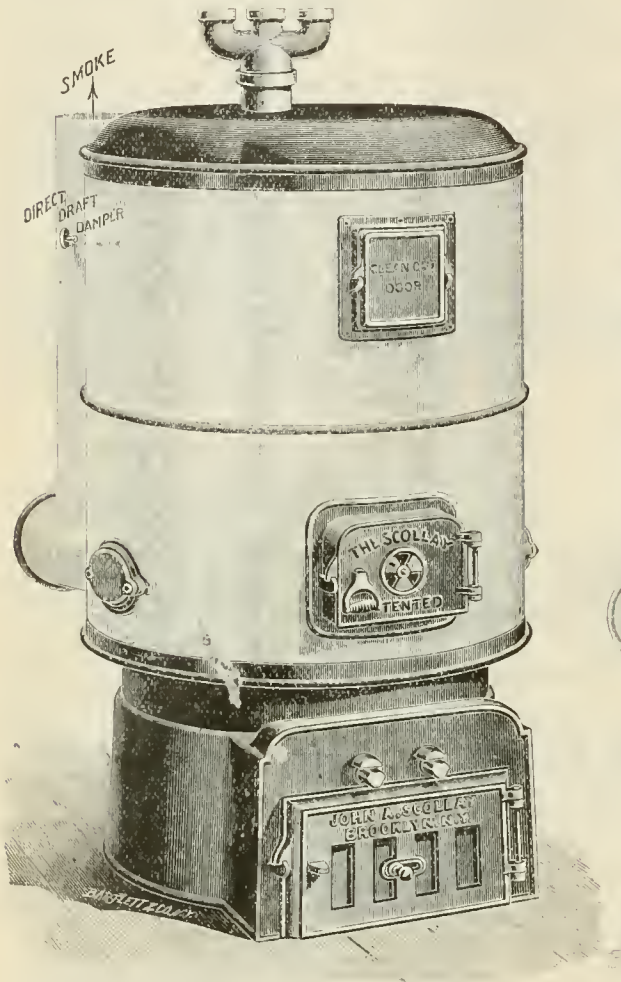


Fig. 1.—Showing Boiler Complete.

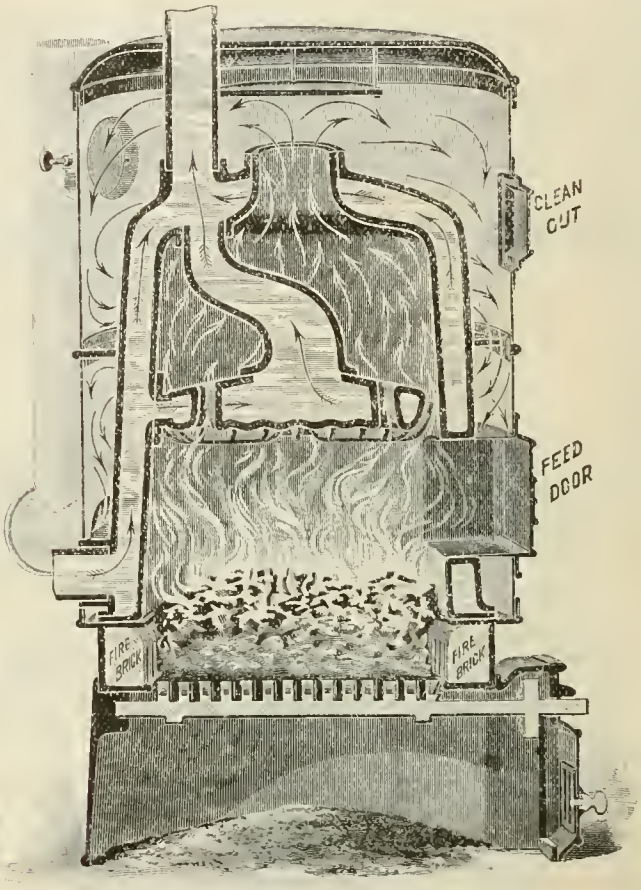
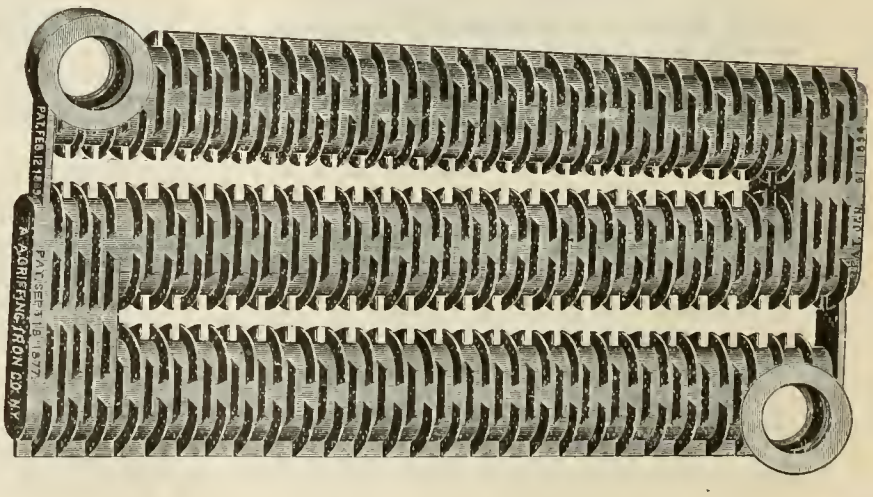


Fig. 2.—Sectional View.

SCOLLAY'S IMPROVED BOILER.

The Bundy Newport Radiator.

The illustration herewith shows a section of a new indirect radiator made by the A. A. Griffing Iron Company, Jersey City, N. J. It is of the extended surface character and each section has three arms. The sections are 37 inches long, 3½ inches wide and 15 inches deep, and are made up into stacks, with heavy 2-inch right and left hand hexagon nipples. They are equally adapted for use with steam or hot water, the openings being at the extremities and the return opening below the water way of the radiator to aid a gravity return. The construction, it is said, insures a positive circulation of either water or steam.



The Bundy Newport Radiator.

The Ideal Boiler Company have recently been incorporated in Chicago, with a capital stock of $100,000, and will manufacture and put upon the market a complete line of steam and hot water boilers. It is the purpose of the company to manufacture boilers with circular fire pot and horizontal sections, and also boilers with square fire pot and vertical sections, with a

view of carrying a line of house heating boilers which shall be surpassed by none in the trade. The president of the company is Geo. E. Downe, late president of the National Hot Water Heater Company, who is well known to the trade in all sections of the country. The new company have leased for their Chicago headquarters the store at 36 Dearborn street, recently vacated by the American Boiler Company.

HEATING NOTES.

THE UNITED STATES HEATER COMPANY, Detroit, Mich., send out a card illustrating their line of heaters, which includes the Capitol, Mascot and Hecla.

H. GILBERT HART, of Hart & Crouse, Utica, N. Y., manufacturers of the Royal line of heating apparatus, will sail for Europe next Tuesday.

THE EXETER MACHINE WORKS of Boston, Mass., manufacturers of the Exeter steam and hot water radiators, have made arrangements with the John Simmons Company, 106–110 Centre street, New York, to handle their goods exclusively in New York State. They are prepared to fill all orders promptly.

THE MODEL HEATING COMPANY, Philadelphia, are sending out a handsome piece of printing in the interest of the Novelty Circulator. It is a four-page card, with a half-tone engraving on the first page of the Novelty Circulator in the latest form, with the text in red and dark green, while the last page is devoted to dimensions, ratings and prices.

GEO. B. CODE & CO., 96 Centre street, New York, have bought out the Welsbach Light Company's Harlem branch store, at 155 West 125th street, where they purpose establishing an uptown branch of their steam and hot water heating business. Their fine display of gas stoves, ranges and Welsbach lights indicates that their gas appliance department, under the superintendence of A. J. Doty, is in very capable hands.

HART & CROUSE, Utica, N. Y., had as a visitor this week Manager W. M. Mackay of their steam and hot water department, at 211 Water street, New York. Mr. Mackay states that the New York Central road is preparing to lay a branch into their new works, which will soon be in course of construction.

THE D. S. MORGAN BOILER COMPANY, 23 West Lake street, Chicago, have released their present location for a term of years.

THE SMITH & ANTHONY STOVE COMPANY, 217 Lake street, Chicago, have secured the agency of the United States Radiator Company, and will carry a full line of their Splendid radiators.

WE ARE INDEBTED to the Richmond Stove Company, Norwich, Conn., for a batch of the pretty catalogues that they are issuing in the interests of their agents. They are small, neatly published and printed pamphlets, containing descriptions and illustrations of their steam and hot water heaters, and each one is issued in the name of some special firm, and at the back of the different pamphlets are testimonial letters from persons who have used the Richmond goods in the neighborhood of the agent. One of these pamphlets carries the name of the Fall River Steam & Gas Pipe Corporation, 93 Pleasant street, Fall River, Mass.; another is issued in the interest of Abram Knowles, New Bedford, Mass.; a third is issued for Paul B Patten, 16 Lafayette street, Salem, Mass.; a fourth for J. H. Alvord, Winsted, Conn. A fifth pamphlet, of larger edition, carries on the front cover and title page the firm name of Isaac Coffin & Co., 52 Sudbury street, Boston, Mass.

W. B. WILKINSON, at 210 Water street, manager of the New York branch of the Howard Furnace Company of Syracuse, N. Y., is showing a method of connecting a combination hot water and hot air furnace with a radiator. The furnace is near a column which supports an expansion tank near the ceiling and a radiator beneath, with all the piping, angle valves and air valves, just as required in practice.

"ROYAL HEATERS: Hart & Crouse, Utica, N. Y.; 211 Water street, New York. Steam boiler catalogue, 1894," is on the cover of a 24-page catalogue which has just reached us. In it are several desk blotters printed in two colors, proclaiming the features and attractions of the Royal line of heating apparatus. The catalogue is devoted to describing the Royal steam heater, with cuts showing construction and operation. Two pages are devoted to ratings for both residences and greenhouses. A full list of the trimmings of the heater is given, with instructions for setting it up and directions for using it.

THE HARELL STEAM HEATING COMPANY, Dunkirk, N. Y., have by special act of the Legislature assumed the name United States Radiatior Company. They manufacture cast iron radiators exclusively and the name Harell Steam Heating Company was misleading, inasmuch as many of the trade assumed that they were engaged in the steam heating business. The new name is comprehensive and appropriate and the management have shown excellent judgment in its selection. We understand that they are erecting new buildings and increasing their output in order to meet the demand for their Splendid radiators. The firm expect to issue a catalogue illustrating and describing their different specialties and which they will distribute to the trade.

ALFRED EMLEY of Emley & Sons, Limited, dealers in marble and plumbers and heating engineers, of Newcastle-on-Tyne, England, was a guest of J. A. Goodrich of the American Radiator Company at 92 Centre street, New York, this week. He visited a number of houses in the heating goods and fitting and supply trade, and expressed surprise at the conveniences of the goods used here. He is now making a more extended tour through the United States, and it is probable it will result in some trade in goods manufactured in this country.

W. M. MACKAY, manager of the steam and hot water department, at 210 Water street, New York, of Hart & Crouse of Utica, is displaying a Royal hot water heater, set up ready for use, in front of the store. It is attractively painted and decorated.

VISITORS to the American Radiator Company, 92 Centre street, New York, will notice that their showroom has been pleasingly rearranged. The back portion of their building is now divided from the showroom by hardwood and glass partition, which includes a private office for J. A. Goodrich and coat and toilet rooms. Back of these are arranged storage closets and shelves for stationery and filing correspondence. Immediately in the rear are the warerooms, the basement floor being used for both the storing and construction of radiators. The ground floor is used for preparing radiators for shipment. Iron strapped wooden cases are more frequently seen as the foreign shipments are on the increase. The beauty of the radiators made in the United States finds a market for them in Europe, South America and Japan. At the front of their showroom radiators of artistic decoration are shown. Radiators in imitation of porcelain are exhibited and decorated in a harmonious combination of coloring and enlivened with gold. In contrast radiators are shown in various electro-bronzes from deep copper to bright brass, and the new aluminum bronze for radiators is a novelty in ornamentation.

The Kewanee Boiler Company

of Kewanee, Ill., and Dearborn and Lake streets, Chicago, have brought out a new and very comprehensive catalogue, No. 3, covering boilers of all kinds for power and heating. This catalogue is of pocket size and contains 128 pages. An introductory chapter gives some particulars about the company's new factory, which is equipped with the most modern boiler making machinery, including hydraulic riveters, hydraulic cranes up to 20 tons capacity, pneumatic lifts, machines for flanging heads and fire boxes, large bending rolls, plate planers, punches, &c. Attention is next called to the high quality of materials used in making the various products turned out by this company and the very thorough tests given all boilers before leaving the works. The catalogue proper begins with illustrations of power tubular boilers, which are shown in different settings and in a variety of styles. These are fitted with the Ætna shaking grate, the Kelly rocking and dumping grate, the Haxtun rocking and dumping grate, Burnham's patent rocking and dumping grate, or common grates. Next come fire box flue boilers for steam heating, vertical tubular boilers, vertical flue boilers, feed water heaters, &c. The Anderson steamer is an apparatus for cooking food for stock or for use in slaughter houses. A line of water heaters is made for laundry and bath purposes. Receiving tanks for steam heating apparatus are shown. The company manufacture all kinds of tanks.

Special attention is called to the Haxtun boiler for steam and water heating. It can be used for hard or soft coal, and is a base burner with either fuel. Illustrations of this boiler are given in brick setting, with part of the brick work removed, in cross section, showing the distribution of water, &c. Several patterns of grates are made for this boiler, illustrations and descriptions being given of each style. The company are jobbers of steam and water supplies, furnishing complete outfits of pipe, fittings, radiators, valves, gauges, &c., for steam and water heating systems. The catalogue contains very full price-lists of these supplies, as well as of the company's own products.

A new material for paving is being introduced into London. It is composed of granulated cork and bitumen pressed into blocks, which are laid like bricks or wood paving. The special advantage of the material lies in its elasticity. In roadways it furnishes a splendid foothold for horses, and at the same time almost abolishes the noise which is such an unpleasant feature of city traffic. It is used in Australia with good results.

ROOFING AND CORNICE.

Roof Flashings.

From B. W., *Milwaukee.*—One of the important parts of a roof is the flashing, or connection between the roof and wall. One of the first methods I used for the purpose is shown in Fig. 1. The tin was laid in the wall by the mason, thus securing a tight joint. After the roof was laid the flashing was bent down and out so it could be nailed to the roof. In this instance tinned nails were used, so they could be easily soldered. In time the nails worked through the solder and caused leaks. When nails are to be used as shown in Fig. 1, it is best to drive them through this joint should break, it is supposed the bent tin behind the flashing would prevent water from entering the building. Some tinners prefer to have a 2 x 4 strip laid in the wall, as shown in Fig. 5. After the brick work is finished, the joint above wood can be cut out by means of a coarse saw, then after sweeping the roof boards the flashing can be placed in position and secured by nailing into the wood. The joint is to be cemented in the usual manner. A strip of tin can be laid in the wall and then bent over the roof tin, as shown in Fig. 6, or a lock joint can be made between the two, as shown in Fig. 7. By the methods thus far presented the flashings have been placed against the wall, thus producing a right angle. Some tinners prefer to have the flashing placed at an angle, as shown in Fig. 8. A strip of wood is secured to the roof boards, and against this strip the flashing is laid; thus abrupt bends are avoided.

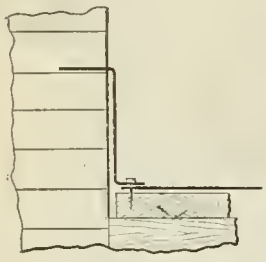


Fig. 1.—*Head of Roof Nail Exposed.*

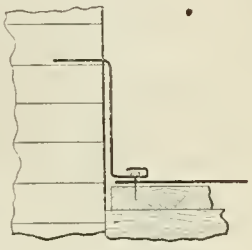


Fig. 2.—*Head of Roof Nail Covered.*

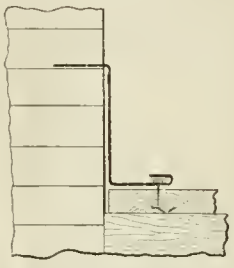


Fig. 3.—*Lock Turned on Flashing.*

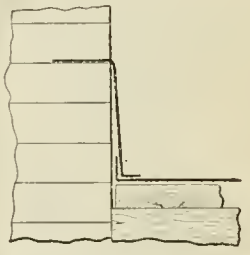


Fig. 4.—*Flashing Bent Over Roof Tin.*

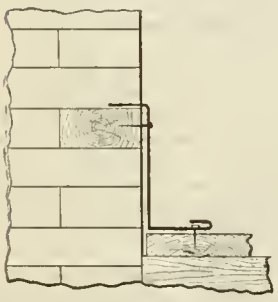


Fig. 5.—*Flashing Nailed to Wood in the Wall.*

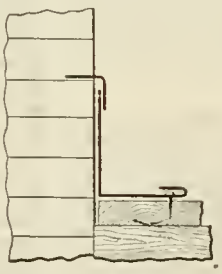


Fig. 6.—*Strip of Tin Bent Over Roof Tin.*

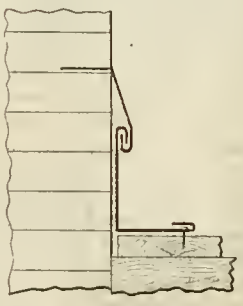


Fig. 7.—*Strips Joined by Means of Lock Joint.*

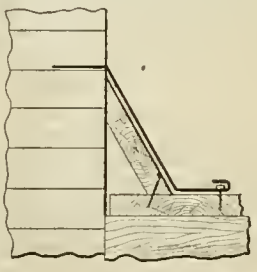


Fig. 8.—*Strip of Wood Placed Behind Flashing.*

ROOF FLASHINGS.

strips of tin cut about ½ x 1 inch, thus allowing the ends of the strips to be bent over the nail heads and soldered. Another method of securing the flashing to the roof is shown in Fig. 2. After the roof is laid the flashing is bent down and out, then an edge is turned up so the flashing can be nailed, when the edge is turned over and soldered. While this method allows the nail heads to be covered, two edges are to be soldered in the place of one, as in the previous instance. By laying the flashing in the wall, then bending down and out, as shown in Fig. 3, a lock can be turned over and secured to the roof boards by nails or cleats, when the roof tin can be joined in the usual manner. In Fig. 4 the roof tin is shown bent up against the wall. After the roof has been soldered the flashing is bent down and soldered to the roof, and if

FLASHINGS.

We are indebted to J. H. Eller & Co., Canton, Ohio, for a copy of their handsome illustrated catalogue for the current year. It is a volume of nearly 100 pages, bound in colored paper with raised design on the front cover printed in bronze. It is the eighth edition of the catalogue, and in it the manufacturers call attention to several new features, especially their improved lock seam steel roofing, plain, round and octagon expansion conductor and a full line of cornices, cresting, finials, vanes, &c The volume begins with general remarks on the construction of steel roofs and rules of measurement and other matters of interest to the trade. This is followed by sectional and other illustrations of roof seams and methods of laying roofs. The next division is given up to corrugated iron of different sizes of corrugations, weather boarding, crimped iron, beaded iron, hip coverings, pressed steel brick, rock faced brick, siding, &c. Then comes the division of the catalogue relating to galvanized iron and tin eave troughs, corrugated and plain round conductor pipe, elbows, shoes, cut offs, strainers, &c. Round and octagon expanding conductor, galvanized iron cornice, crestings, finials, ornamental hip caps, weather vanes, &c. The book is profusely illustrated, and in addition to the prices full information is given of the articles referred to.

The East Birmingham Iron Roofing & Corrugating Company, Birmingham, Ala., distribute a highly ornamented postal card, which calls attention typographically and pictorially to their pressed standing seam roofing.

Charles Schaeffer, one of the best known sheet metal workers of Chicago and for years a writer on practical subjects for the trade press, has engaged in the cornice business with his brother. Their establishment, which is styled Schaeffer's Cornice Works, is located at 1014 to 1022 Central Park avenue, cor-

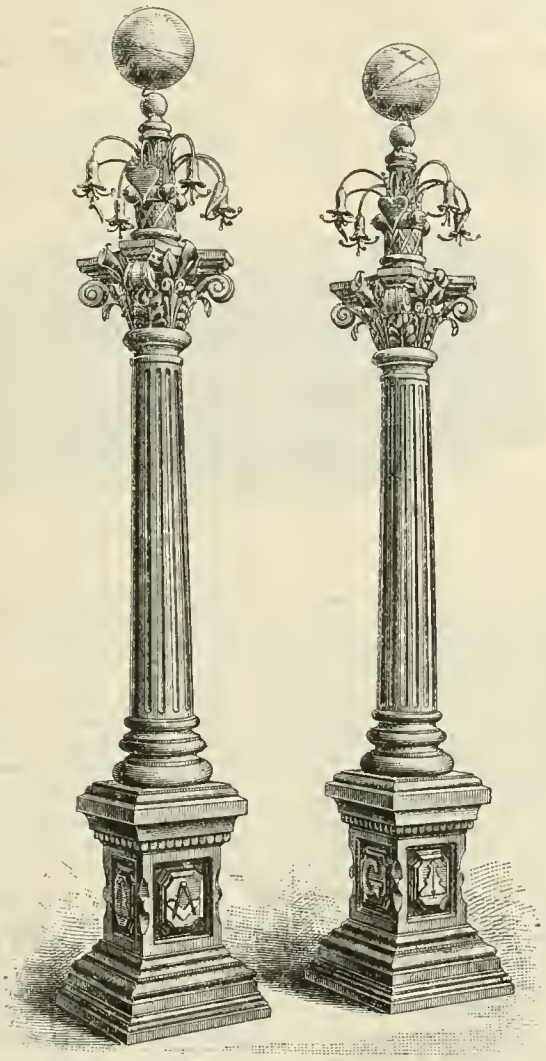
ner of Twenty-second street, Chicago. They make a specialty of artistic and round work.

The Acme Roofing Company, Canton, Ohio, issue a handsomely published illustrated catalogue and price-list of their manufactures, which include a full selection of sheet metal goods in the roofing and kindred lines. The first articles noted are eave troughs and gutters with gutter hangers. Then come conductor pipe and conductor heads, followed by elbows, rain water cut offs, ventilators and ridging. Cresting blocks and finials are illustrated in many styles. A number of pages are given to cornices, showing a number of different architectural designs. Finials are likewise illustrated and then attention is given to skylights. The second section of the catalogue is devoted to roofing, and the goods noticed are the Acme standing seam steel, roll cap, double seam, folding seam, pressed standing seam, corrugated pressed standing seam, corrugated iron siding, steel pressed brick, weather board siding, ceilings, &c. The volume is profusely illustrated and is indexed at the back. The cover is of heavy colored paper with the name and address stamped on the front and printed in gilt.

Messrs. Hill & McGinty, who have wbeen for many years ith E. B. Badger & Son, Boston, Mass., have started in business for themselves at 20 and 22 Pitta street as sheet metal workers, coppersmiths and roofers. Mr. Hill was confidential clerk and bookkeeper for Messrs. Badger & Son for 25 years and Mr. McGinty has been with them as foreman for the past 15 years. Their former associates gave Messrs. Hill & McGinty a handsome oak roll top desk last Saturday, the presentation speech being made by Thaddeus Flynn.

Sheet Metal Columns.

We present in the accompanying engraving an illustration of a pair of sheet metal columns that will be of interest to many of our readers. The following letter, which was received with the photograph of the work from Barrett, Hicks & Co., Fresno, Cal., contains a brief description of it:

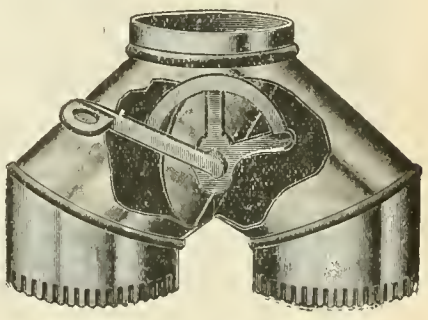


Sheet Metal Columns.

We inclose you photograph of a piece of work just completed by our cornice maker, Jack Dressel. It is a little out of the ordinary line and our Masonic friends will immediately recognize what the columns are intended for. The columns are made of galvanized iron, except the leaves, flowers and work around the capitals, which is hammered copper work done by hand. All columns of this kind which we have ever seen have been made of wood, and as our weather is so hot in summer it occurred to us that these could be gotten up of galvanized iron to stand any weather and any climate. So we undertook the job, and think we have made satisfactory work of it. The columns are 22 inches square at the base and 12 feet high. The globes on top are 12 inches in diameter. The shaft can be removed from the base, which is intended to be filled with sand.

The Acme Rain Water Cut Off.

We show in the accompanying illustration a broken view of the Acme rain water cut off, manufactured by the Acme Roofing Company, Canton, Ohio, and on which a patent is pending. Special attention is directed to the simplicity of its construction and to the fact that it cannot be turned by the water. It is pointed out that there are no springs to get out of order, break or become loose. The Acme cut offs have been manufactured and sold for a year, and wherever used have, we understand, given excellent satisfaction. The cut offs are made of the best grade IX bright plate, japanned, and also of galvanized iron, in all sizes.



The Acme Rain Water Cut Off.

Net Price of Galvanized Sheet Iron.

We have had a number of inquiries for copies of the table giving the net price of galvanized sheet iron which was printed in *The Metal Worker*, April 7. We have, therefore, issued the table in more permanent form, published on manilla card suitable for shop and office use. The card will be sent on receipt of 10 cents by David Williams, 96-102 Reade street, New York.

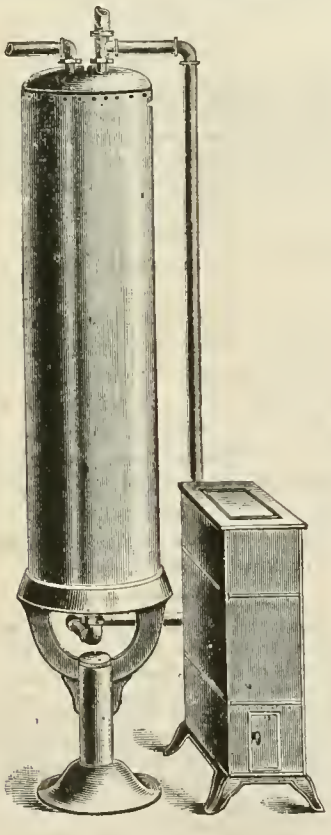
Senatorial obstructionists at Washington would do well to ponder the methods of the Canadian Parliament in the dispatch of financial business. Canada's new tariff went into effect on March 27, a few hours after it had been brought down to the Assembly by the Minister of Finance. At 3 o'clock that afternoon all the telegraph lines were monopolized by the government, and by 8 a.m. the next day every custom house in the Dominion—some 800 in number—was in possession of the new tariff in full.

According to the *Puget Sound Lumberman*, the output of lumber in the State of Washington for 1893 was of the value of $10,700,000, in addition to $2,636,000 of shingles. The figures in feet were: Lumber, 764,234,912; shingles, 1,829,528,500. This was greater than the output of Oregon, British Columbia, Montana and Northern Idaho combined.

PLUMBING and GAS FITTING.

Vulcan Water Back.

W. M. Crane & Co., 838 Broadway, New York, are introducing the Vulcan water back, as here shown, to be used in connection with gas. It is made of cold rolled steel and angle iron in two sizes. No. 1 is 27 inches high, 16 inches deep and 8 inches wide. No. 2 is twice the width of No. 1, the other dimensions being the same. Between the outer steel casing and the water back within is a lining of either soapstone or fire brick, which has a covering also of mineral wool as an economizer of heat. It is fitted with their patent socket burner, which can be instantly removed for cleaning, and has an adjustable air mixer which they refer to as suitable for any gas. The heated water passes in at the top of the boiler, gradually forcing its way down. An advantage is claimed that in drawing water at the faucet it is not necessary to wait until the entire mass has been heated, it being possible to draw directly from the water back or that portion in the top of the boiler. The No. 1 is for 30 to 60 gallon boilers,



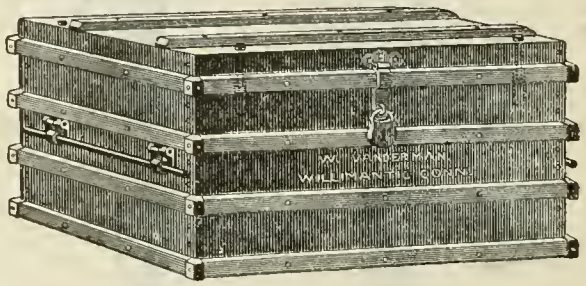
Water Back for Gas.

and consumes, they state, 30 cubic feet of gas per hour. No. 2 has just twice the capacity, and consumes double the quantity of gas. When the water is once heated the supply of gas can be reduced to 20 feet an hour.

In response to the call of President Daniel G. Finnerty of the National Association of Master Plumbers, the plumbers of Vermont met April 11, at Rutland, and organized a State association, which has affiliated with the Nation Association and will be represented in the convention at Detroit. The officers are: President, W. P. Jones, Rutland; treasurer, E. A. Valiquette, Rutland; secretary, E. H. Bagley, White River Junction.

Vanderman's Steel Tool Chest.

The Vanderman Plumbing & Heating Company, Willimantic, Conn., are putting on the market a tool chest made of steel which is intended to take the place of the ordinary tool chest used by plumbers, steam fitters and others. A general view of the chest is shown in the accompanying illustration. The material of the chest is $\frac{1}{16}$ inch sheet steel, with malleable iron corner pieces and hardwood braces, as shown, and is fitted with bolts to secure the cover, and furnished complete with hangers, lock, key and wood drawer. The manufacturers say that it cannot be broken or bent out of shape by any use to which a tool chest is put. The chests, which are finished with paint, are made in three sizes—11 x 12 x 24 inches, 14 x 15 x 30 inches and 16 x 17 x 36 inches, the weights being, respectively, 40, 60 and 75 pounds.



Vanderman's Steel Tool Chest.

TRAPS AND VENTS.

The Mechanics' Supply Company, 96 St. Peter street, Quebec, Canada, issue what they term "A Gentle Reminder." It is a folded card directing attention to their business and the goods they handle, which comprise gas, water, steam and plumbing supplies.

Barrett & Wallace are a new firm at Cohoes, N. Y., who will do tinning, plumbing, gas fitting and steam and hot water heating.

The uptown store of the J. L. Mott Iron Works, at 147 West Thirty-fifth street, New York, is largely used by plumbers to show the different styles of baths, closets and fixtures to their customers, owing to the fine display there made.

The Stewart Ceramic Company, 312 Pearl street, New York, are making some substantial improvements to their premises. Their office is now located on the first floor and their sample room has been enlarged to double its former size. This enables them to make a fine display of their solid white crockery washtubs and butler's pantry, corner, slop and kitchen sinks. They are also showing a bathtub of their manufacture which is one of their newest productions.

John Tucker of New York has opened a first-class plumbing establishment at 32 Bellevue avenue, Newport, R. I.

Disley & Weyland have purchased the large vacant lot on the south side of Jefferson street, Waterbury, Conn. The property has a frontage of 60 feet on Jefferson street, with a 10-foot driveway. They expect to build a three-story block for their plumbing and cornice business.

Hayward & Reynolds are a new plumbing firm at 335 Columbus avenue, New York. They were formerly with the Durham House Drainage Company.

Supplies for the steam fitter, gas fitter and plumber are the specialties of W. H. Hussey & Son, 150 West Thirty-fifth street, New York.

C. H. Pettit, 262 West Thirty-fifth street, New York, makes a specialty of plumbers' wood work. In addition to a variety of closet seats, bath rims and washtub covers he makes to order whatever may be required for special cases in any kind of wood.

At a recent meeting of the Master Plumbers' Association of Memphis, Tenn., resolutions of respect and sympathy were passed, and ordered sent to the family of J. W. X. Browne, an esteemed member who recently died.

Wm. H. Raley & Co. is the name of a new firm of plumbers and tinsmiths, located at 604 Washington street, Lynn, Mass.

John Apgar is erecting a store for R. Giles on Main street, Plainfield, N. J., where Mr. Giles will carry on the plumbing business.

Geo. R. Pasco, 274 Columbus avenue, New York, speaks highly of the smoke test as an aid to the sanitary engineer and plumber. He is now occupied in remodeling a number of plumbing systems whose defects were discovered by the smoke test.

The many friends of Thomas C. Knight of the Henry McShane Mfg. Company, 50 and 52 Myrtle avenue,

Brooklyn, N. Y., will be glad to learn that, notwithstanding the reports in the daily papers of his having been drowned in the storm last week, he is still dispensing plumbers' goods at the old stand.

C. H. Muckenhim of the South Lyon Mfg. Company of South Lyon, Mich., manufacturers of plumbers' wood work, in a recent visit to New York established an Eastern agency with Du Bois & Darrow, 61 Gold street, who are also Eastern agents for the Utopia Water Closets made by Park-McKay Company, Detroit, Mich.

J. A. Fairbanks & Co., the new plumbing firm, at Brewer, Maine, are doing the plumbing in the new addition that is being made to a building by A. C. Kavanaugh on Wilson street.

The Board of Examiners of Plumbers of Watertown, Mass., at their last meeting examined five candidates, and all passed. They were W. J. Murphy, John C. Clark and M. T. Burke as master plumbers, and John W. A'Hearn and Herbert Goding as journeymen plumbers.

W. Z. Evans, Delaware, Ohio, has sold his plumbing business to Pumphrey & Armstrong.

The National Association of Master Plumbers, with present executive offices at 148 Boyleston street, Boston, Mass., Daniel G. Finnerty president, have issued in convenient form "A List of Manufacturers and Jobbers of Plumbers' Material Who are in Harmony with the National Association of Master Plumbers." The little book contains the names of a great many prominent supply houses and manufacturers of plumbers' goods in the United States. The names are arranged alphabetically, so it is an easy matter to refer to any individual firm. At the back of the pamphlet are printed the famous Baltimore resolutions with the amendments up to June 15, 1893.

The Bramhall Deane Company, 262-266 Water street, New York, make a specialty of the manufacture of sterilizing apparatus, many of which are specially adapted for hospital use, and operated by either steam or gas and some by a lamp. They are devised for sterilizing the instruments used by surgeons and the bandages and dressings used in operations. Another apparatus is used for sterilizing or disinfecting the clothing of patients admitted to hospitals. The water sterilizer, which has been illustrated in our columns, is designed to furnish water for either drinking, cooking or surgical purposes. These goods open a new field for the plumber in his sanitary work, as the larger apparatus require either lead or iron pipe for their connections. The hospitals of Atlanta, Ga.; Elizabeth, N. J.; New Haven, Conn.; Boston, Mass., are equipped with these apparatus. The Kings County Hospital, at Flatbush, and the German, Presbyterian and Roosevelt Hospitals and the Eye and Ear Infirmary in New York are some of the other institutions in which these sterilizing apparatus have been used with satisfactory results.

In response to the advertisements of the Board of Education of Newark, N. J., for bids for the plumbing and steam heating repairs for the next year, two bids were received that have attracted some attention both in and out of the trade. One bidder offered to furnish journeymen at $2.20 and helpers at 50 cents per day, and another at $2.50 and 75 cents respectively. The ruling prices in Newark for good workmen are 60 cents an hour for plumber and helper, and 70 cents an hour for steam fitter and helper, and the discrepancy has excited some adverse criticism on the plumbers and steam fitters. The Master Plumbers' Association of Newark held a special meeting to consider the matter and a committee has been appointed to see the low bidders and get an explanation.

John Delehanty.

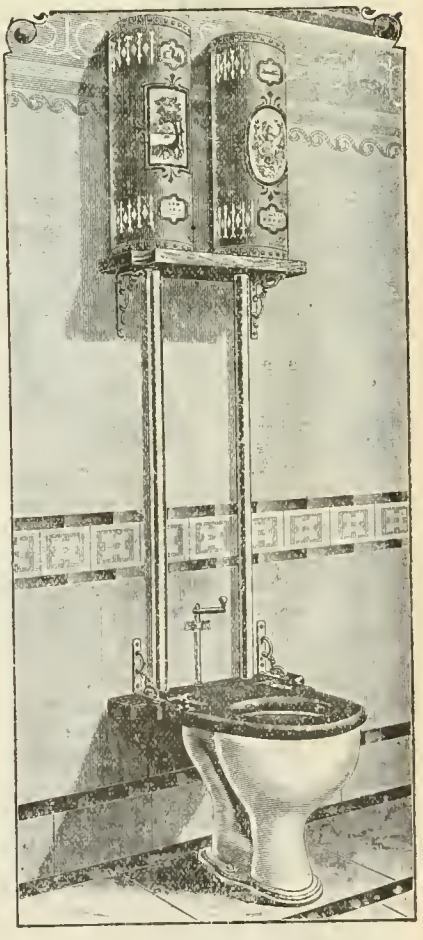
The students who have been through the plumbing course of the New York Trade Schools are all interested in John

John Delehanty.

Delehanty, whose portrait is given here. Mr. Delehanty was born in 1860, and as a youth was bookkeeper in the plumbing establishment of I. O. Shumway until he left to serve a regular apprenticeship at the plumbing trade with another New York plumber, Wm. Foster. In 1890 he started an establishment, and is now interested in two shops under the firm name of Delehanty & Roach, one at 906 Columbus avenue, the other at 679 Second avenue. For the past two seasons he has held his present position, having been selected by the Trade School Committee of the Master Plumbers' Association of New York, of which association he is a member. In addition to the knowledge and skill he has acquired from experience, Mr. Delehanty has a fund of information gained from reading and studying plumbing literature and problems. Another invaluable qualification for his position is best explained by an observation of the wag of this year's class: "I have learned about all I want to know except whether or not Delehanty has a temper." Having had 144 pupils in the day class this year, 114 were graduated, and instruction given to two night classes of 79 and 74 respectively. In his work he was ably assisted by a well qualified corps of instructors. John McMenomy has been a plumber over 40 years and Rufus A. Clarke is another apprentice of the fifties. Thomas Kelly has given talks on modern plumbing before the journeymen's union. Thomas B. Walmsley, who learned his trade in England, has worked in South Africa, and for the past ten years in New York, was the instructor of the lead burning classes which made such a fine showing this year. George B. Woods and James J. Lynch are two other instructors, whose services were necessary on account of the size of the classes.

The Kelly Double Tank Water Closet.

The water closet which is herewith illustrated is the latest production of Thomas Kelly & Bros., 124 Franklin street, Chicago. The closet bowl used is of the syphon jet pattern. The two tanks and two valves are independent of each other, the valves being located below and at the rear of the seat. The operation of the closet is as follows: One of the air tight tanks fills with water while the other is empty, and by turning the handle shown above the seat, a valve is opened and the tank that is filled discharges its contents into the closet bowl. The operation of turning the crank opens the valve connected with the empty tank, which fills as far as the pressure of water can compress the air. The bowl contains a large quantity of water, which is forced out by the jet from tank. There are no movable parts in either tank or closet bowl, the only movable parts in connection with them being the valve pistons and the handle for operating them. Among the points of advantage claimed are the absence of noise and the impossibility of overflow; waste of water is also prevented. Either one or the other of the tanks acts as an air chamber at all times. There being such a large air chamber, the tendency is to prevent bursting of pipes and water hammer when used in a house of ordinary size. The claim is made that any objection that may be



The Kelly Double Tank Water Closet.

entertained regarding the use of syphon jet closets on account of the difficulty of giving open tanks sufficient elevation to produce the desired water pressure is overcome by the use of the double air tight tanks.

STOVE TRADE NOTES.

The Stove Convention.

Some changes have been inaugurated in connection with the annual convention of the National Association of Stove Manufacturers, to be held in Chicago next month, which it is expected will add materially to the interest and value of the meeting. Heretofore committees have had in charge the work of presenting reports or papers covering certain subjects relating to the business of stove manufacture, these papers being read at the sessions and discussion invited from the members present. The impression seems to have gained force in the minds of some of the members that greater good would result by slightly changing the method of procedure, and this year a new plan has been adopted. Invitations have been extended to various manufacturing concerns in the membership of the association to prepare papers on the subjects which were enumerated in our columns March 31, and in every instance we understand the invitation has been accepted. The topics announced cover a sufficiently wide range to draw out remarks from all present and evoke a lively discussion, which should tend to awaken increased interest in the proceedings of the national body. With a view to facilitating the business of the convention there will be no adjournment dividing the morning and afternoon sessions, but a short recess will be taken in the middle of the day, when a cold collation will be served in the assembly room. By this means members will be enabled to follow the progress of the discussion on any subject without serious interruption, and at the same time more satisfactory results will be accomplished. Judging from the circular lately issued by Secretary Thomas, the meeting should prove a most interesting and important one.

The Dippo Mfg Company of Cleveland and Chagrin Falls, Ohio, are making rapid progress in the manufacture of the Ferrosteel ranges, reference to which was made in these columns not long since. Mr. Dippo, who has been practically connected with stove making since boyhood, is very enthusiatic over the new mixture known as "Ferrosteel," which name has been adopted for both the metal and the productions of the company. The latest move upon the part of the company has been to secure W. M. Powell as vice-president and manager of the sales department, with headquarters in Cleveland. Mr. Powell is well known from his long connection with the management of the stove department of the James Smart Mfg. Company of Brockville, Canada.

Cupola Management.*—X.

BY DR. EDWARD KIRK.

Dumping.

As soon as the molders are through pouring their work, if there is no iron to be melted for other purposes, preparations are at once made for dumping the refuse from the cupola. The blast is first shut off by stopping the blower and the tuyere doors are at once opened to prevent the escape of gas from the cupola into the blast pipe, where it might do much harm. The melted iron in the cupola is then drawn off by the cupola men and poured in the pig bed. If there is a lot of small iron in the cupola that has not been melted time is given it to melt to save picking it out of the dump, but if there is a lot of pig or other heavy iron unmelted it is let fall with the dump and the bottom is dropped as soon as the melted iron is drawn off.

The small props supporting the bottom are first removed and laid away. The main prop is then removed by striking it with a long bar at the top or pulling with a hooked bar at the bottom, and the instant it falls the doors drop. When the doors of a large cupola drop, the sand bottom and a greater part of the refuse of melting falls with them and a sheet of flame and dust instantly shoots out ten feet or more from the bottom of the cupola in all directions. But the flame disappears in an instant and the dust settles, revealing the white hot dump in a heap under the cupola. The cupola men then throw a few buckets of water on it to chill the surface and deaden the heat, and the melter puts a long bar into the tuyeres and tries to dislodge any refuse that may be hanging to the lining while it is hot. Small cupolas do not dump so freely, and the sand bottom has frequently to be started with a bar after the door drops. A long bar must be used for this purpose and the melter must be on his guard, for the dump may fall as free as from a large cupola the instant it is started and a sheet of flame shoots out.

Small cupolas frequently bridge over above the tuyeres, and only the sand bottom and refuse below the bridge is dumped when the door falls. The aim of the melter is then to break away the bridge or get a hole through it, so the cupola will cool off in time to be made ready for the next heat. He puts a bar in at the tuyeres and breaks away small pieces at a time, and if there is not a large body of refuse in the cupola, a few short pieces of pig are thrown in from the charging door, so they will strike in the center and break through the bridge. This bridging and hanging up of the refuse in a cupola when only run for a few hours is entirely due to mismanagement, for any cupola, no matter how small it may be, can be run for six or eight hours without bridging and be dumped clean if properly worked.

When the dump falls from a cupola it is a semi fluid mass of iron, slag, cinder, dirt and fuel. This mass falls in a heap under the cupola, and if scattered or broken up when very hot it is more readily wet down and more easily removed when cold. In some foundries a heavy iron hook or frame is placed under the cupola before dumping and is withdrawn with a chain and windlass after the dump has fallen upon it and been partially cooled with water to harden it so the hook will not slip through it without breaking it up and scattering it. In other foundries it is scattered with a long rake or hook worked by hand. In pipe foundries two or three short lengths of condemned pipe are placed under the cupola before dumping, and the dump is broken up by running a bar into the pipe and lifting them up after the dump has been slightly cooled. But in a great many foundries where the dump is small or where there is plenty of room to remove it when cold it is let lie as it falls and is wet down by the cupola men, or a few buckets of water are thrown on by the cupola men to deaden it, and it is left for the watchman to wet down during the night. Care must be taken to not put on too much water or the floor under the cupola will be made so wet there will be danger of the dump exploding when it falls upon it the next heat.

Removing the Dump.

A number of plans have been devised for removing the dump from under the cupola. Iron cars or trucks have been constructed to run under the cupola and receive the dump as it falls, but they cannot be used unless there is sufficient room for the doors to swing clear of the car, and few cupolas are so constructed. The dump must be removed from the car when hot to avoid heating and injuring the car, and considerable room is required for handling the car after it is taken from under the cupola. For these reasons cars are seldom used. Iron crates have been made to set under the cupola and receive the dump and be swung out with the crane, but they get fast under the cupola and soon are broken, and it is almost as much work to handle the dump from the crate as it is from under the cupola. A number of other plans have been tried, but the dump must be picked over by hand, and it is as cheap to pick it over at the cupola and remove it in wheelbarrows as any way that has yet been devised. The dump is broken up with sledge and bar when cold and picked over. The large pieces of iron are picked out and thrown in a pile for remelting. The coke is thrown in a pile to be taken to the scaffold or core oven furnace. Anthracite coal that has passed through a cupola and been subjected to a high heat will not burn alone in a stove or core oven furnace, and it is very doubtful if it produces any heat when mixed with other coal and again put in the cupola, and only the large pieces are picked out, if any.

The cinder, slag and other refuse are shoveled into a wheelbarrow and taken to the rattle barrels or dump. If the sand bottom is to be used over again it is riddled out in a pile and wetted.

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If not, it is removed with the cinder and slag. As soon as the bulk of the dump is removed the melter goes into the cupola and breaks down the ring of cinder over the tuyeres and chips off any that may be adhering to other parts of the lining. The dump is then all removed and the floor around the cupola is cleaned up preparatory to daubing up. Nothing is done with the dump after it is taken from the cupola but to recover the iron from it. This is done in two ways, by picking it over or milling it. The iron is often of the same color as the dump, and so mixed with it that it is almost impossible to recover it all by picking unless a great deal of time and pains is taken; and it is cheaper to throw out only the pieces of pig and shovel all the remainder into the tumbling barrels, where it is separated in a short time and all the iron recovered that is worth recovering.

Chipping Out.

Before going into the cupola to chip it out the melter slushes one or two buckets of water around the lining from the charging door to lay the dust. He then goes in from the bottom if he can get in, but if the cupola is so badly bridged he cannot get up into it he takes a long bar and endeavors to break down the bridge from the charging door, or goes down into it from the charging door, and with a heavy bar or sledge breaks it down. As soon as he gets a hole through large enough to work in he goes down through it and with a sledge or heavy pick breaks down the shelf of slag and cinder that always projects from the lining over the tuyeres. He then takes a sharp pick and trims off all projecting lumps of cinder and slag and gives the lining the proper shape for daubing up. It is not necessary or advisable to chip off all the cinder and inherent matter down to the brick, for the cinder stands the heat equally as well as new daubing, and in some cases better. But all soft honeycombed cinder should be chipped off and all projections of hard cinder that are likely to interfere with the melting or tend to cause bridging should be removed.

Some melters have a theory that to prevent iron running into the tuyeres they must have a projection or hump on the lining over the tuyeres, and they let the cinder build out from 3 to 6 inches thick and 6 to 12 inches deep at the base. These humps tend rather to throw iron into the tuyere than to keep it out, for the fuel becomes dead under the hump and the iron in its descent strikes the hump and follows it around into the tuyere. They also form a nucleus for bridging. The refuse of melting as it settles lodges upon these humps and is chilled by the blast. A small cupola with these humps over the tuyeres will not work free for more than an hour, while the same cupola with the humps removed and the lining straight would work free for two hours and dump clean. They also interfere with the melting and cause bridging in large cupolas All humps that form on the lining above the melting point from bad charging or other causes should be removed, for they hang up the stock and retard melting.

The cupola picks generally used are entirely too light for the work to be done with them and the handles are not firm enough. When the melter strikes a blow he cannot give the pick force enough to cut away the point desired and the handle gives in the eye so the pick glances off and cannot be held to the work. Repeated blows with a light pick turn the edge and renders the pick worthless and the melter has to do two or three times the work really necessary in chipping out the cupola, and then he does not get it right. What the melter wants is a heavy pick with a firm handle. Then he can hold the pick where he strikes and prevent it glancing off. He can strike a blow that will cut away the cinder at one stroke and not jar and injure the lining nearly as much as he would by repeated blows with a light dull pick. The melter should be provided with three picks made of the best steel, weighing 4, 6 and 8 pounds each. They should be furnished with iron handles solidly riveted in, or should be made with large eyes for strong wood handles. The picks should be dressed, tempered and ground as often as they get the least bit dull.

Columbian-Garland Range.

The Michigan Stove Company of Detroit, Chicago, Buffalo and New York City have just issued a fine catalogue of their new line of wrought steel ranges brought out under the name of Columbian Garland. The catalogue is a handsome specimen of the engraver's art and the printer's skill. It is 8 x 10 inches in size, and only contains 16 pages and is bound in a paper cover, but on these comparatively few pages has evidently been concentrated an unusual amount of book making taste and experience. The cover is illuminated with richly embossed gold lettering. A silken cord ties the leaves together. The body of the ink used in the book is black, but it is relieved by an occasional crimson line, which is by no means out of place, but very tasteful. The engravings are half tones of remarkable sharpness, which bring out the special features of the range with excellent effect.

The Columbian-Garland range is described in this catalogue as of moderate price, but strong, durable and desirable in every way, and possessing all the advantages of higher priced goods. Three styles of grates are furnished—the duplex for hard coal, a very heavy flat shaking and dumping grate for soft coal, and a special wood grate. All these grates and their frames pull out and can be instantly changed or replaced without disturbing the bed plate or fire box linings. The ash pan is unusually large, and guards are provided which throw all the ashes into the pan. The draft is not only admitted through the ash pit door in front, but also through slides at the end of the range to the full length of the fire box. The oven is "aërated" like the ovens of other Garland cooking stoves and ranges. The entire oven can be drawn out by simply turning four buttons, thus giving access to all flues. The oven door is of steel, smooth on the inside, and when open it answers for a shelf, being counterbalanced with a weight and spring. A pedal attachment can be used both to open and shut the door. The top of the range is made up of pans or key plates, having two kettle holes in each. The front pan has a loose center, which is practically indestructible. Two or more ranges of this line can be placed together and connected to make a continuous range, with one fire box for each oven.

The illustrations show first the Columbian-Garland range, with low closet and in square form, made in six sizes; next, with high shelf and low closet, in six sizes; third, with high shelf, low closet and a 15-gallon copper reservoir on brackets at the side, also in six sizes; fourth, with high shelf, low closet and broiler on brackets at the side, also in six sizes; fifth, with high and low closet and square form, in six sizes; sixth, with high shelf, low closet, and connected with hot water boiler; seventh, with double oven, high shelf and low closets.

ODD PLATES.

The Harvey Furnace Company, at 1325 Broadway, New York, make their Vim furnaces and ranges a specialty and find a regular demand for heating with hot air.

The F. E. Belden Mica Mining Company, 12 Broad street, Boston, Mass., are putting on the market New Hampshire mica, for which they claim particular clearness and fine rift. It is put up in pound packages in convenient form for the stove trade.

The Thatcher Furnace Company, 33 Peck Slip street, New York, manufacturers of the Thatcher and Scorcher furnaces and the Champion steam and hot water apparatus, are making some necessary changes in their manufacturing plant at Newark, N. J. They are putting up a substantial and capacious brick building for storing their patterns and are making a large four-story addition to their foundry building.

The Rocket, Columbus and Servia ranges, made by Southard, Robertson & Co., Peck slip and Water street, New York, are now conspicuously displayed for the consideration of the buyers of summer goods. A novel sign is displayed over their new Waldorf range. Letters spelling the word have been sawed out of 1-inch white pine and mounted on black walnut and varnished.

The New York office at 244 Water street of the Raymond & Campbell Mfg. Company, Middletown, Pa., is preparing for the summer trade in ranges by receiving two carloads of Anna, Capital, Model, Perfect and Grand Perfect ranges.

J. Snyder of the Thomas, Roberts, Stevenson Company, Philadelphia, spent the week at their New York house at 250 Water street, in the interest of the Gauze Door and Fortune line of stoves and ranges.

The Warren Hardware Company of Warren, Ohio propose to erect a plant for the manufacture of steel ranges. They announce that under no circumstances will they accept from the citizens of Warren any contributions or bonus to influence the location of the plant. Some movement of that kind was started because of the rumor that other towns were bidding for the new works.

The works of the Electric Oil Stove Company, Homer, Mich., are the subject of an illustrated notice in a late issue of the Homer *Index*, published every Wednesday at the place named. From this article we learn that the proprietor and general manager of the works, Benjamin R. Goodrich, went to Homer about 19 years ago with a capital of less than $1000 and embarked in the hardware business. Gaining more than an average degree of success, he retired in 1885, accepting a position as traveling salesman for the Detroit White Lead Works, continuing with the company for about two years. In 1888 he commenced business as a manufacturer,

having invented a self heating folding bathtub with automatic connecting waste tube. In 1890 he invented an oil heating stove, and disposing of his bathtub rights, turned his attention to the manufacture of oil stoves. The works of his company are well equipped with the necessary machinery for carrying on the business, but it is the intention to soon install a new engine of more than double the horse power of the present one. One of the buildings is devoted to the grinding, polishing and nickel plating departments, another to the mounting and crating rooms, tin shop, &c., while a third is occupied as a testing room and paint shop. The office occupies a one-story building, which is separated from the others. According to the article referred to there were in the first year of the company's existence upward of 7000 heating stoves manufactured and sold, while in 1890 the output was 11,000 heaters and 6000 ranges, and in 1892 there were 13,000 heaters and 14,000 ranges and lamp stoves turned out. The works give employment to a force of hands ranging from 20 to 80, according to requirements. R. E. Goodrich assists in the general management; A. E. Knight has charge of the shipping department; Charles Gardner is inspector of castings, and James Merrett is foreman of the shops.

The Danville Stove & Mfg. Company of Danville, Pa., will bring out this season, under the name Ideal, a line of square heaters, comprising four sizes, handsomely nickeled and ornamented, and designed to meet the demand for high class medium priced goods Their line of ranges will be augmented by the addition of the Beaver, a new six hole construction of moderate price, with solid or portable hearth, hopper or pouch feed, adapted to all kinds of fuel, duplex or triplex grate, with or without shelf, handsome nickel bracket and band, and large ash pit. The new range will also be made embodying a patented device for heating an upper room. The company are also improving the line of Beaver furnaces and redressing their line of Queen Beaver ranges. They report a satisfactory business for last season, notwithstanding the dull times, and the close of the season found them with very little stock on hand. They are this season, in addition to their own lines, pushing sales of Monarch gasoline goods, for which they are agents for New England, New York, New Jersey and Pennsylvania.

The Fuller & Warren Company, Troy, N. Y., issue advertising cards calling attention to the fact that house heating with hot air furnaces and hot water boilers is at present attracting considerable attention and add that their F. & W. Co. furnaces produce excellent results. They invite the trade to send for their illustrated catalogue.

J. H. Cort & Sons, Beekman and Water streets, New York, are fitting the kitchens of the St. Lawrence apartment house, at Eighty-eighth street and Madison avenue, with gas ranges. Their Cort gas range, with high shelf and canopy, is the only cooking apparatus used. Hot water is furnished from an apparatus in the basement. Their ranges have been used in the Carrollton, Pontiac and Palacio apartment houses with general satisfaction.

We are indebted to the Magee Furnace Company of Boston, Mass., for a neat little folder announcing that within the past three months the patterns for the Boston heater have all been made over and many valuable improvements introduced. It is also stated that the company are using heavier plate iron in the construction than ever before. The Magee Boston is well known from Maine to California, and in the little folder which the company have issued are set forth some of the claims made for it. We also have from the company a circular recently issued by E P. Carpenter Company of Pawtucket, R. I., which is in the nature of an advertisement of the Magee Grand range. This stove has proven exceedingly popular with the trade in the territory covered by Messrs. Carpenter, and during the fall season of 1893 they sold 173 Magee Grand ranges, a record which it is claimed was never before made in the same time by any dealer in New England. The circular gives a list of the names and addresses of the purchasers. This shows what enterprise and push can accomplish in the sale of goods possessing superior features of construction and operation.

The Littlefield Stove Company of Albany, N. Y., send us a copy of a pamphlet which contains some new matter relative to the West Shore range. It is entitled: "Fifty-nine Years' Experience from the James or Saddlebag Stove to the West Shore Range for 1894." The opening pages describe the important inventions incorporated in the West Shore range, following which are particulars gleaned from the records of the Patent Office and designed to show the difference between the West Shore and other ranges. A feature of the pamphlet is the directions for setting up and starting a fire in the West Shore range and the size of coal which should be used. The pamphlet is profusely illustrated and shows the range named in numerous styles and sizes. Mr. Littlefield states that the pamphlet contains "the truth, the whole truth and nothing but the truth; therefore it will be of value to studious readers."

The Peninsular Stove Company of Detroit, Mich., are distributing some very pretty decorated cards of a size to be easily carried in the pocket, and which are intended for advertising the Peninsular stoves and ranges. The cards constitute the first installment of the company's stock of advertising matter which is being prepared for dealers handling Peninsular goods. The side of the card carrying the ornamental design has in the upper right hand corner a chocolate colored panel containing six words, as follows: "Quick bakers; superior cookers; powerful heaters." In the lower left hand corner is a *facsimile* of the company's trade-mark.

William Kerby, 4 and 6 Peck slip, the New York representative of I. A. Sheppard & Co., Philadelphia, is showing a seasonable attachment to the Royal Fidelity range. It is a cross piece to which two gas burners are attached which takes the place of the regular cross piece and supplies a flame under both of the cooking holes of the fire chamber. A cock for each burner is provided and an attachment for connecting a hose to supply the gas. It can be applied and used by any one. Those ranges which have an upper warming shelf can be supplied with gas burners attached to the shelves.

Gas and gasoline stoves and summer ranges, under the name Manhattan, are now attractively displayed by Eugene Munsell & Co., 218 Water street, New York. They also make a specialty of supplying mica for all purposes, and to meet the requirements of stove manufacturers they are prepared to furnish first-class mica in any desired size and quantity. For the smaller dealers packages of various quantities, containing an assortment of convenient sizes, are prepared.

Hansell & Belson have leased the showroom and warehouse at 144 North Second street, Philadelphia, and will enter into the wholesale stove business, representing Chas. Noble & Co. in the vicinity of Philadelphia. They will also represent some leading refrigerator, gasoline, oil and gas stove manufacturers, and will carry a full line of supplies for the stove trade.

A. B. Fisher, 387 Kent avenue, Brooklyn, N. Y., is just completing patterns for an entirely new gas regulator or air mixer for gas stoves. Mr. Fisher makes an extensive line of gas stove faucets and air mixers.

Reports from Chattanooga, Tenn., are to the effect that the capacity of the works of the Southern Queen Range Company, located in that place, is to be doubled.

The Wilcox Heat-Light Company, Grand Rapids, Mich., have issued from the press a 16 page pamphlet, bound in straw colored covers, and relating to the line of oil heating stoves which they manufacture. The assortment includes the Model oil heater, made in several sizes, the Challenge, the Eclipse and the Standard. The company state that for this season they have added several new styles and have made a number of important improvements. The Model gas radiator is one of their specialties and possesses features which render it powerful in operation. A point to which attention is invited is the presence of a water pan under the burner. The water fount is made of heavy cast iron, enameled, and is claimed to be peculiar to this radiator.

At a meeting of the Warren Hardware Company, held Saturday, April 7, it was decided to commence work on the new buildings as soon as possible. The main structure will be about 40 x 150 feet in size, and it is expected to have the plant in running order the latter part of May. When the new works are completed the company will employ from 25 to 50 men and will turn out about 20 ranges a day.

Hart & Crouse of Utica, N. Y., have leased the store 79 Lake street, Chicago, Ill., where they will carry a full line of Royal heaters for hot water, steam, hot air and combination. The firm will take possession of their new quarters on May 1 and the management will be in the hands of George L. Rood, who will at all times be ready to show the goods and furnish estimates for heating.

The Fox Furnace Company, 28 Vincent street, Cleveland, Ohio, have issued an attractive catalogue relating to warm air furnaces. It consists of 30 pages of letterpress bound in colored paper colors, and presents a great deal of information and value to dealers handling goods of the character named. The opening pages show how the joints in the Fox furnaces are made to render them perfectly tight and also illustrate and describe the grate, dust flue and fire pot which the company use. The Fox furnace is offered in a variety of styles and sizes, tables being given showing prices and dimensions. A list of testimonial letters from various in-

dividuals and concerns indicate in some measure the satisfaction which the heaters have given to users of them.

THE CHICAGO & ERIE STOVE COMPANY favor us with an illustrated circular of the Erie gasoline stove which they have just placed upon the market. The stove is made in several sizes, is simple in the arrangement of its parts, and is provided with a single generator. The burners are sawed on the side, rendering them, the makers claim, very economical, because they spread the flames into thin sheets, securing a large amount of heat in proportion to the quantity of fuel consumed. The cast top is of ample proportions, with a space between the burners. The independent burner is made on the same general plan as those described in connection with the single generator. Nos. 20 and 120 are made with a single generator for two burners, while Nos. 30 and 130 have three burners. The No. 1 Erie has one independent generator; Nos. 2 and 12 have two independent generators, and Nos. 3 and 13 have three independent generators. The manufacturers state that the tank has an inside arrangement to expel the air from the pipes when first lighted, making a quick flow of gasoline to the burners.

F. & L. KAHN & BROS., Hamilton, Ohio, send us circulars illustrating and describing the I X L Family Peerless gas stoves, which embody many interesting features. The roaster and broiler are situated below the top and are of sufficient capacity to meet all ordinary requirements. Baking is done in the oven above the top, the oven having a drop door which makes a shelf when opened. The burners have removable covers and adjustable air mixers. These goods are shown in several varieties, as are also the I X L table stoves with one, two and three burners. A second circular relates to the Waldorf broiler and roaster for any kind of gas. This is claimed to be the latest and most efficient broiler and roaster for hotels, restaurants and large families. The doors when opened stand flush against the right and left ends of the broiler and out of the way. Attention is also invited to the Bijou Junior, a four-burner all cast hot plate, and to the Corker, shown with one, two and three burners.

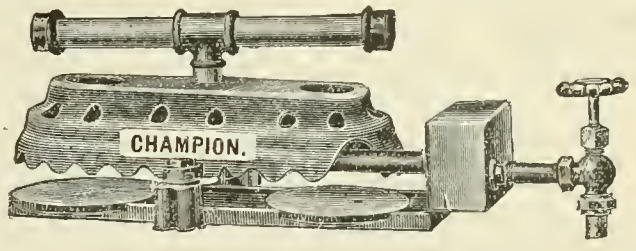
E. C. HANRAHAN has been appointed Western manager of the Peninsular Stove Company, in immediate charge of the company's branch house at 79 and 81 Wabash avenue, Chicago. Mr. Hanrahan has been connected with the company for about a year. He was previously located at St. Louis, where he conducted a stove jobbing business. Mr. Hanrahan is well acquainted with the Western stove trade and is thoroughly conversant with all the details of the stove business.

A FOUR-PAGE CIRCULAR which is received bears the inscription: "A Few References from Parties Using Richardson & Boynton Company's Warm Air Furnaces Erected by the Canfield Stove Company, 166 Strand and 19 Ferry street, Rondout, N. Y." The testimonial letters are from various sections of New York State, and indicate in a very forcible manner the estimation in which the goods named are held by those who have practically demonstrated their merits.

WILLIAM J. H. GLUCK of Baltimore, Md., is sending out a little pamphlet illustrating the Reliance and Reliance Safety gasoline stoves, which are made in several styles and sizes. These goods are finely japanned and ornamented, and are provided with safety Reliance tanks. The burners are the Reliance individual burner No. 2, operated with nickeled wheel blunt valves, so that the flames can be turned down low.

Champion Oil Burner.

In the accompanying illustration we present a general view of the Champion oil burner, which is being offered the trade by the National Oil Burner Company of Cleveland, Ohio. The burner and valves, which represent the result of years of experimentation, are covered by United States patents granted last year. In operation it is simply necessary to place the burner on the grate of the cook stove or range in connection with which it is employed, drill a ⅝-inch hole in the stove door, or put on a sheet iron door, and connect the pipe and valve to the burner. The oil tank may be placed on a bracket against the wall near the stove, or it may be placed outside of the house, as most convenient. The burner for use in connection with heating stoves is placed in position in the same general manner as described above. The manufacturers claim the burner will not smoke or carbonize and can be used without odor or noise. It is made strong and durable, and the company say they will replace any burners showing flaws or defects within one year. They use a special rolled lead pipe for the purpose of conveying the oil from the tank to the burner. The oil tank is made of heavy galvanized iron.



Champion Oil Burner

Camden, N. J., is to have gas at $1.25 per 1000. The gas company having improved their plant, continue their enterprise by offering their gas at a much reduced rate.

Advices from Springfield, Mass., state that 300 of the new Krag-Jorgensen rifles have been completed and are about to be sent to the War Department. Samples of the new gun have been sent to the Governors of the different States, and one of the new guns was sent on Tuesday to the German Emperor. Samples are also to be sent to the officers of the departments in the United States Army. The Fourth United States Infantry will be the first regiment equipped with the new piece.

The Central New Jersey Traction Company have been incorporated at Trenton, N. J., to carry out a scheme for connecting New York and Philadelphia by trolley. A supplementary charter is being obtained in Pennsylvania for a line from Philadelphia to Trenton. Construction of the trolley lines between Paterson and Orange and Trenton and Kingston is, it is stated, to be begun at an early date.

SCRAP.

IMPORTS of tin and terne plates into the United States during the first eight months of the present fiscal year were of the value of $7,883,304. In the corresponding period ended February 28, 1893, the value of tin plates imported was $10,304,543.

MARSHALL BROS. & Co. of Philadelphia report a fair volume of business for the past month. They are exceedingly busy in their black plate department, consequent upon the increased demand for American tin plate.

HENRY W. SCATTERGOOD, proprietor of the Black Diamond Tin Plate Works, Laurel street, Philadelphia, reports an improvement in the demand for his products. His brands are the Black Diamond, an extra coated roofing plate; Quaker City, Horse Shoe, Arrow and Laurel.

HUGHES & PATTERSON of Philadelphia have closed down their tinning plant, having a stock of plates on hand sufficient for the present requirements of their trade.

GOV. ROBERT E. PATTISON of Pennsylvania was a visitor in New Castle, Pa., last week, and while there visited a number of industrial establishments. The Governor seemed to be particularly impressed with what he saw at the plant of the New Castle Steel & Tin Plate Company. In this establishment he witnessed the operation of making tin and terne plate from the billet to the finished plate, or more properly speaking, from the ore to the finished plate, as the billets are obtained from the Shenango Valley Steel Company, whose plant is located adjacent to that of the New Castle Steel & Tin Plate Company. The pig iron used by the Shenango Valley Steel Company is made by themselves, so that it can be truthfully said that the Governor saw tin and terne plate made from the ore to the finished material.

THE REPORT of Gummey, Spering & Co., Philadelphia, Pa., to Special Agent Ira Ayer of the Treasury Department, respecting their output of tin plates for the quarter ending March 31, 1894, gives the following figures:

Total make tin and terne	1,116,330
Tin plates	214,296
Terne plates	902,034
American black plates	898,431
Foreign plates	217,899
Tin under 63 lbs. per 100 square feet	213,453

Terne plate all under 63 lbs.

The firm of Gummey, Spering & Co. began making plates early in 1892, and have not stopped except a few days for repairs since then. A particularly gratifying fact in the above report is the great amount of American black plates, more than three-quarters of the total product being of American origin and only 218,000 pounds of foreign plates.

TRADE REPORT.

The Iron Market.

The intimations of an improving market made last week appear to have been confirmed by recent developments. A considerable amount of business has been placed, and there are very few furnaces or mills that have not made substantial additions to their order books. There is also quite a good deal of business under negotiation, and while prices show little or no improvement, the sentiment is more hopeful than it has been for many weeks past. The increase in the output of Pig Iron concurrently with a decrease in stocks is a significant feature, and is not without influence on those who closely watch the course of events. No great advance is looked for, but it is expected that the next two or three weeks will show that the corner has been turned, and the building up process fairly commenced.

Pig Iron.—As yet no intimations have come to sales agents of Southern furnaces in the New York district to withdraw from the market as the result of the troubles in the Birmingham coal mines. On the contrary, prices lower than ever have been made during the last week. Sales of Western Pennsylvania Irons are being pushed in this territory, and it is reported that they are going right into the foundries in the Lehigh Valley. One point which is attracting some attention among sellers is the rapid decline during the past year in the proportion of No. 1 Iron which founders are using in their mixtures. Some of them have learned to get along without it altogether. We quote standard brands $12.50 @ $13.25 for No. 1; $11.50 @ $12.25 for No. 2, at tidewater. Southern Iron, same delivery, $12 @ $12.50 for No. 1; $11 @ $11.50 for No. 2; $10.50 @ $11 for No. 3; $10.75 @ $11.25 for No. 2 Soft, and $11.25 @ $11.50 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10.25 @ $10.50.

In the Philadelphia district a better demand for Pig Iron is reported, and for nearly all grades of the metal, but prices are quite irregular. The only way to get an exact quotation is to name brand, quantity, delivery and terms of settlement, and as these vary, prices vary. The quotations given below fairly indicate the range of quotations in Philadelphia and vicinity, although at Harrisburg, York and Susquehanna Valley points 25¢ @ 40¢ less has been accepted owing to advantages in freights, &c., but even then there is frequently a wide disparity in quotations.

Standard No. 1 Foundry X	$12 50	@	$11.85
Standard No. 2 Foundry X	11.75	@	12 25
No. 2 Plain	10 75	@	11.00
No. 1 Soft	11.00	@	11.50
No. 2 Soft	10.50	@	10 75

A large number of sales of Bessemer Pig have been made during the month in the Pittsburgh district to Eastern mills, while a considerable tonnage for speculative purposes has also been closed, the whole aggregating some 100,000 tons. There is no change in the situation of Foundry Iron, which continues in light demand with prices ruling very low. Quotations are given as follows:

No. 1 Foundry	$11.00	@	$11.25,	cash.
No. 2 Foundry	10.25	@	10.50	"
No. 3 Foundry	9.75	@	10.00	"
Bessemer	10.35	@	10.50	"

Transactions in the Chicago market in both local and Southern Coke have been almost wholly confined to small lots. The most important sale last week was one of about 2000 tons of local Iron. The demand for small lots comes from all classes of customers, but the aggregate volume of such business is by no means satisfactory to furnace companies. Consumers are still apprehensive of disturbing influences which may again unfavorably affect prices, and consequently inquiries are unusually light. Very little is doing in Lake Superior Charcoal. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00	@	$15.50
Local Coke Foundry, No. 1	11.25	@	11.50
Local Coke Foundry, No. 2	10.50	@	11.00
Local Coke Foundry, No. 3	10.00	@	10 50
Local Scotch	11.50	@	11.75
Ohio Strong Softeners No. 1	13.00	@	14.00
Southern Silvery, No. 1		@	11.50
Southern Silvery, No. 2		@	11.00
Southern Coke, No. 2	10.00	@	10.35
Southern Coke, No. 3	9.75	@	10.00
Southern, No. 1, Soft	10.25	@	10.50
Southern, No. 2, Soft	9.75	@	10.00
Tennessee Charcoal, No. 1	15.00	@	15.50
Tennessee Charcoal, No. 2	14 50	@	15.00
Alabama Car Wheel	17.85	@	18.00
Jackson County Silvery	15.00	@	16.00
Other Ohio Silvery	13.00	@	13.50

Advices from Southern markets indicate that there has been a fair volume of business in Coke Pig Iron during the week, but not much movement in other kinds. Prices as a rule have been well sustained by the furnaces, which have sold mainly at delivered prices and therefore buyers in many instances have secured supplies at a lower cost to themselves. The strike or threatened strike among the laborers in the South makes sellers cautious, although it is thought that the difficulties will be adjusted without any great amount of friction. The sales for spot and forward delivery aggregate for the week upward of 15,000 tons and sales have been contracted for the remainder of the year at the same prices as are accepted for spot delivery. The buyers of Iron are mainly stove and agricultural works. The Iron Pipe works are melting considerable Iron but are not purchasing much. The market, as a whole, while not essentially better, is certainly no worse than it has been. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$10.50	@	$10.75
Southern Coke, No. 2	9.25	@	9.50
Southern Coke, No. 3	8.75	@	9.00
Ohio Soft Stone Coal, No. 1	14.50	@	15.50
Ohio Soft Stone Coal, No. 2	14.25	@	14.50
Lake Superior Coke, No. 1	13.00	@	13.50
Lake Superior Coke, No. 2	12.00	@	12.25
Hanging Rock Charcoal, No. 1	17.00	@	17.50
Hanging Rock Charcoal, No. 2	16.50	@	17.00
Tennessee Charcoal, No. 1	13.00	@	13.50
Tennessee Charcoal, No. 2	12.00	@	12 50
Standard Southern Car Wheel	16.25	@	17.00
Lake Superior Car Wheel and Malleable	16.50	@	17.00

Metal Market.

Pig Tin.—From the prices that ruled at the date of last week's report there has been an advance of about 0.25¢ ℔ lb, 19.75¢ having been realized for 5-ton lots of Straits Tin for delivery before the end of the current month. The rise was due chiefly to strong advices from London on the 16th inst., but facilitated by the fact that the stock in New York is not only moderate but the holdings so scattered that the market is extremely sensitive to London manipulations. Subsequently values here went a fraction lower, for no other visible cause than a reaction in the foreign market, sales being made late in the week at 19.60¢ for spot and 19.55¢ @ 19 60¢ for April delivery. There is little speculation here at present, and hardly any tendency in that direction. The shape of the market is not attractive. Straits shipments during the first half of the month were quite heavy, including 800 tons to Great Britain and America and 475 tons to the Continent, against a total of 775 tons in the corresponding period last year. Consumption is rather below the average for this season of the year. Prices for small parcels are unchanged at a basis of 21¢ @ 21¼¢ ℔ lb.

Copper.—Business on home account has been larger during the past week. Liberal contracts were made with consumers at 9¼¢ for Lake Ingot, deliveries running up to July. Supplies of Montana product have been cut off to some extent by the Great Northern Railroad strike,

but Arizona product has come forward in sufficient quantity to meet the demand and orders for the cheaper varieties of Copper are being filled at old prices, say 9¼¢ @ 9⅜¢ for Electrolytic and 9¢ @ 9¼¢ for ordinary casting brands. The volume of sales to consumers has been moderate. These latter are buying on an exceedingly prudent scale, taking only just as much as they actually need for present use. Retail prices are about at the level of the last few weeks, Lake Ingot ruling at 10½¢ ℔ lb for small lots from store.

Sheet Copper.—The demand for this material has not expanded to any appreciable extent, nor will it be likely to increase until there is more evidence of a resumption of activity in the building trades. Prices, however, hold their own.

Pig Lead.—The market has been very steady at the higher range of prices established last week. Nearly, or quite, 1000 tons have been placed in round lots, at or about 3.45¢, by local brokers, and a number of single carloads were sold at 3.47½¢. Meanwhile, there was some effort to force prices lower, chiefly by one or two local firms, but the effort was fruitless, since other than Eastern buyers not only purchased quite freely, but had brokers on the alert for all Lead offered at less than 3.45¢ for delivery this month or next. The buying during the week has been chiefly for jobbers and consumers. Very few purchases were made for speculative account. Still jobbers report business as being of a tame character, and not up to the standard of a week or two ago. Indeed, the demand during the present month has not borne out the promise of March, when a very fair movement developed after the long months of depression.

Lead Pipe and Sheet.—Orders and inquiries for Lead Pipe and Sheet Lead have fallen off somewhat from the slightly better volume developed in the first part of the month, doubtless due to the return of cold and stormy weather. A better movement is hoped for so soon as settled weather approaches and buildings now in hand are pushed to completion. Stocks in consumers' hands are very light, but purchases do not, as a general rule, extend beyond absolute requirements for present use. Prices are fairly well maintained and collections are reported as good.

Spelter.—There are some signs of a steadier turn to the market. The best evidence of this is that no response is made to requests for firm offers of the poorest Western brands at 3.55¢, delivered here or at common point. The tests made indicate that 3.60¢ is the very bottom price, and that sellers at less than 3.65¢ are the exception. No large transactions have been effected here, but sales of moderate sized lots to galvanizers make a better showing than for some time past. Small quantities of Western from store are quoted by jobbers at about 4¢ @ 4¼¢ ℔ lb. About 50 % of the producing capacity of the country is shut down. Several furnaces have ceased operations since our last report, so that there is every reason to expect that values will not go much, if at all, lower.

Sheet Zinc.—The consumptive demand is of a very perfunctory character. Manufacturers have again put down the price of Sheet Zinc 2 % during the past week, and it is now far below any previously quoted value. Jobbers' price for 600 lb casks is 4½¢: small lots selling from store at 5¢ @ 5¼¢ ℔ lb.

Antimony.—Fair sales have been made and the market is quite steady at about 8¾¢ @ 8⅞¢ for Hallett's, 10¢ @ 10¼¢ for Cookson's, and corresponding prices for minor brands, with a premium of about ⅛¢ on small quantities.

Nickel.—Little change has taken place, purchases being of routine character and fair, all told. Prices range between 40¢ and 45¢, as to size of lot.

Tin Plate.—So far as regards wholesale buying, little if any improvement has been experienced during the week in sales for either prompt or future delivery. Considering the season of the year this market is exceptionally quiet and business below expectations. The majority of canners appear to have secured sufficient material by contracts for future delivery entered into at the beginning of the year, while the remainder may be hanging on until the last moment before placing their orders. Be this as it may, the demand from this class of consumers has been remarkably tame of late. Jobbers report, however, that small orders for spot goods have been sufficient to keep them very fairly busy, although these are almost entirely of the hand to mouth character that has become chronic of late, and their aggregate is hardly up to the spring season average. Roofing Plates show some more animation with the return of the building season. Prices are still uneven and more or less irregular, despite the fact that stocks here are considerably below the average and that foreign manufacturers are seriously considering a further reduction of output to offset the bearing of slow sales. Importations for this year have been comparatively light, while foreign stocks are becoming heavy. This is partly explained by the fact that some importers find it cheaper to carry their stocks in store on the other side than to hold them in bond in this country.

A special cable dispatch to *The Iron Age* dated London, April 18, reports the British Tin Plate market as follows: Tin Plate business has been of very fair volume, but the market shows soft tone. At the quarterly meetings prices ruled in buyer's favor. Fair orders were placed for 10 x 10 Siemens Cokes at 3 pence decline, and for Squares at 3⅛ pence under market quotations. Liverpool quotations for Plates were as follows:

IC Charcoal, Alloway grade	12/ @ 12/6
IC Bessemer Steel, Coke finish	11/3 @ 11/6
IC Siemens " " "	11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20	Nominal.
Charcoal Terne, Dean grade	10/3 @ 10/6

Sheet Iron.—Galvanized Iron is in fair demand, but the volume of business is hardly up to the average, owing to the backwardness of the building industry. Prices are fairly well maintained. The demand for Black Sheets is usually light at this season, but at the present time this feature is intensified by the prevailing dullness of trade, and the market for this material remains extremely flat. Prices are low, and entirely in buyers' favor.

Chicago Report.

Scrap.—Business is light and offerings from country Scrap collectors are large. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb.
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Business is quiet. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6.75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

THE PERRY STOVE COMPANY, Albany, N. Y., are at the present time bringing into special prominence their line of Oil Stoves, more especially No. 24 Shoo Fly with two-hole removable extension top and shelf, the Argand and the Fire Fly. In a page announcement elsewhere illustrations of these goods are shown and some particulars given.

CONDITION OF THE

Hardware Trade.

REPORTS indicate that trade in the different parts of the country varies considerably in tone and volume. A general feature of it is its unevenness, the orders of one day or week being relatively large and encouraging, and those of the next more or less disappointing. From several sections there is evidence of a steady improvement in the condition of things, and the indications point toward a gradual movement in this direction. The small trade are buying somewhat more freely notwithstanding the complaints that are made in regard to this matter from some markets, as more fully referred to in some of the following reports. It is also a significant fact that some of the representatives of large Western houses have recently been placing orders for future delivery, and express the confidence that before very long there must be a marked increase in the volume of trade. In the matter of prices there is little to add to what was said last week, the market being devoid of strength in many lines, with a tendency toward lower quotations. Collections give little ground for complaint.

Advices from Chicago.— A little better demand is reported for Shelf Hardware and also for roofing and tinners' materials from the general country trade. House furnishing goods and tinware experienced a little increase last week, but the gain then felt has been lost by this time and trade has relapsed iuto its former dullness. Copper goods have advanced slightly in consequence of the increased price placed on sheet copper. The improvement in this line of business is, however, more than counterbalanced by the lower rates made on staple goods. The prices named by jobbers ou the latter have been modified considerably during the past week, but greater concessions have been made to the city than to the country trade. Jobbers appear to be competing most vigorously for city business, although it is only a small proportion of the trade which they handle. Heavy Hardware jobbers have felt no improvement in their demand, but report their customers buying very sparingly and keeping stocks down as low as possible. Wagon builders are doiug considerably less than last mouth and appear to be afraid to make up stock to any extent. Collections are fair.

Notes on Prices.

Wire Nails.—There appears to bc something of a falling off in the volume of business, but the manufacturers are in receipt of many orders and are fully occupied. Some of these orders are from the large houses, but many of them are for comparatively small lots, the aggregate of the busineas, however, being large. Quotations are the same as last week, 95 cents at mill being a representative price, which is shaded only in the case of especially large and important orders. Small lots from store in New York are held at $1.20 to $1.25.

Advices from Chicago.—The advantages promised in February from the closer alliance made by Wire Nail manufacturers have all been lost, and the business in this branch has relapsed to its old condition. A prominent manufacturer says that, himself included, the manufacturers of Wire Nails are the biggest fools in the Iron and Steel trades. They have permitted themselves to fritter away one of the best opportunities they ever had to conduct a steady spring trade at a reasonably fair margin. The current demand is light, and yet the factories seem to be in possession of sufficient orders to enable them to run for the whole of this month and perhaps into the next. Their stocks are under the average held at this time of the year, and whenever specifications are sent in they are followed up promptly by telegrams if immediate shipments are not made. The trade, therefore, ought to be in good condition and prices ought to be maintained. Factory quotations are still about $1.05, Chicago, but with concessions on good sized quantities, while small lots from stock are selling at $1.15 to the country trade.

Cut Nails.—It is evident that the Eastern manufacturers are feeling more than for a long time the effect of Western competition, and within the past week or two some Western mills which have heretofore held aloof have been making quotations in Eastern markets. The price of Nails delivered in New York is 95 cents to $1 base. Small lots from store in New York are regularly quoted at $1.10 to $1.15.

Advices from Chicago.—The Steel Cut Nail manufacturers report a smaller volume of business, but they are still able to pick up enough orders to keep their works in operation. Prices are a little weaker, and may now be quoted at 95 cents on 55-cent average. Jobbers are selling small lots from stock at $1.10, but make concessions to the city trade.

Barb Wire.—There is a good demand for Barb Wire, but it is not so heavy as a few weeks ago. Manufacturers are, however, fully occupied with orders, and in some cases are not able to ship as rapidly as their customers would desire. Notwithstanding the volume of business the market is showing increasing signs of weakness, and concessions are made more freely than a few weeks ago. The market is represented by the following quotations on Four Point Galvanized delivered at the points named: Pittsburgh, $2.05 @ $2.15; Cleveland, $2.10 @ $2.20; Cincinnati or Allentown, $2.15 @ $2.25; Chicago or New York, $2.25 @ $2.35. There is more complaint in regard to irregularity in prices in Western markets than in the Eastern, but the effect of the concessions which are being made is quite generally felt.

Advices from Chicago.—The excellent demand for Plain Wire is perhaps having a better influence on the Barb Wire market than the actual demand for fencing from dealers and consumers. The miscellaneous consumers of Plain Wire are taking as large quantities as usual, so that there is less disposition to sacrifice the Barb Wire end, although business in this respect has fallen off to some extent. Prices on Galvanized Barb Wire may be quoted at $2.30 to $2.35 for small lots from stock, with 10 cents less for carload lots.

Cordage.—An increased demand is reported, being apparently stimulated somewhat by the low prices ruling. The market, however, is not in any better condition as regards quotations than at our last review, inasmuch as prices, in sympathy with the decline in raw material and as a result of active competition, continue low. The market is represented by the quotation of 6 cents base on Manila, a price which a few manufacturers decline to meet, but which on the other hand has by others been slightly shaded on large and attractive orders. Sisal and New Zealand hold quite steadily at 4 cents.

Sheet Zinc.—Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue revised discounts on Sheet Zinc under date of April 11. The price continues $4.50 for Sheet Zinc in 600-pound casks, of the thicknesses between Nos. 9 to 15, inclusive, and of the widths between 32 to 46 inches, and of the lengths between 84 to 90 inches. The extras are also unchanged. The discounts as revised are as follows:

Discounts.	First class. 15 600-pound casks and upward.	Second class. 10 to 14 600-pound casks.	Third class. 5 to 9 600-pound casks.	Fourth class. Under 5 600-pound casks.
	Per cent.	Per cent.	Per cent.	Per cent.
Special	11	11	11	11
Cash with order	3	3	3	3
Quantity	3	2	1	0
Totals	17	16	15	14

All discounts are computed straight when money accompanies the order. Quantity discount is added to special discount in all cases. If remittance is received within 10 days of date of invoice the cash discount will be only 2 per cent. instead of 3 per cent., and not computed straight. Each order is strictly

subject to the quotation of the class to which it belongs.

Combined Cutlery Case and Money Drawer.—This article is put on the market by the Waddel Wooden Ware Works, Greenfield, Ohio, by whom it is sold at $12.50 each.

Glass.—There is a continuance of the better feeling in the Glass trade which has been noticed during the past two weeks, and an increased firmness in prices. Manufacturers and jobbers have to a great extent withdrawn quotations, and in many cases have advanced prices. It is claimed that the stock of Glass in manufacturers' and jobbers' hands is less than 500,000 boxes, while the customary stock on hand at this season of the year is stated as having been 2,000,000 to 2,500,000 boxes; while efforts are usually made to increase that amount to 4,000,000 boxes or over before the shut down. The limited stock of Glass on hand and the prospect of an increased demand are the causes of stiffer prices, as it is understood that the present stock would not be sufficient to supply the demands of the trade for one month under ordinary circumstances. In addition to this there is reported less than two-thirds of the number of pots in operation, or 1038 pots. There have been meetings held by the Glass manufacturers of Pittsburgh and of the gas belt, and while no official report of the proceedings have been published, it is understood that there is a desire for unity on the part of both. Pittsburgh quotations are given as 85 per cent. discount for single and 85 and 10 per cent. discount for double strength Glass. Under date of April 12, a Cleveland jobbing house quoted 85 and 5 for single and 85 and 10 per cent. discount for double strength Glass in quantities less than 25 boxes. There is a feeling of encouragement among Plate Glass manufacturers and jobbers, with a price agreed upon by the entire jobbing trade of New York, it is stated, of 70 and 10 and 70 and 5 per cent. discount, according to quantity. French Plate is quoted at 70 and 10 per cent. discount.

Old Metals.—There has been some improvement in the demand for Old Metals, but prices do not show much advance. The demand is generally fair for Scrap Iron at former rates, but the market is weak. The following quotations represent the ruling prices given by New York dealers:

Heavy Copper	℔ lb 7½¢
Light and Tinned Copper	℔ lb 6½¢
Heavy Brass	℔ lb 5½¢
Light Brass	℔ lb 4½¢
Lead	℔ lb 3¢
Tea Lead	℔ lb 2¢
Zinc	℔ lb 2¾¢
No. 1 Pewter	℔ lb 14¢
No. 2 Pewter	℔ lb 7¢
Wrought Scrap Iron, ℔ gross ton	$9.00 @ ....
Heavy Cast Scrap, ℔ gross ton	7.00 @ ....
Stove Plate Scrap, ℔ gross ton	4.50 @ ....
Burnt Iron, ℔ gross ton	3.50 @ ....

Old Rags, Paper, &c.—There is a moderately active market for these materials, but prices have not improved any. The following quotations are about the prices given by New York dealers:

No. 1 White Rags	℔ lb 3¼ @ 3½¢
No. 2 White Rags	℔ lb 2 @ 2¼¢
Mixed Rags	℔ lb ¾¢
Blues and 3ds	℔ lb 1 @ 1¼¢
Hard Sized White Shavings	℔ lb 2¼ @ 2½¢
No. 1 White Book Shavings	℔ lb 1¾ @ 2 ¢
No. 2 White Book Shavings	℔ lb 1 @ 1⅛¢
Light Book Shavings	℔ lb ¾¢
No. 1 Mixed Shavings	℔ lb ¾ @ 1 ¢
No. 2 Mixed Shavings	℔ lb ½ @ ¾¢
No. 1 Printed Books	℔ lb 1 @ 1¼¢
Ordinary Mixed Books	℔ lb ½ @ ¾¢
Newspapers	℔ lb 2-5 @ ½¢
No. 1 Manila Paper	℔ lb 1 @ 1½¢
No. 2 Manila Paper	℔ lb ⅝ @ ¾¢
Bogus Paper	℔ lb ½¢
Common Paper	℔ lb ⅜¢
Straw Chips	℔ lb ½¢
Binders' Clippings	℔ lb ½ @ ⅝¢
Jute Butts	℔ lb 1⅞ @ 2 ¢
No. 1 Jute Bagging	℔ lb 1 @ 1¼¢
Mixed Bagging	℔ lb ¾ @ 1 ¢
No. 2 Bagging	℔ lb ½ @ ¾¢
Hemp Twine	℔ lb 2 @ 2¼¢
Manila Rope	℔ lb 2¼ @ 2⅝¢
Jute Rope	℔ lb 1½ @ 1¾¢
Mixed Rope	℔ lb ¾ @ ⅞¢

Old Rubber.—The market for Old Rubber is fairly good. Prices rule about as follows, but are subject to variation and are somewhat irregular:

Car Springs, ton lots, ℔ lb.	@ $0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@ .03½
Rubber shoes, less than carloads, ℔ lb.	@ .03¼
Large Hose, ℔ ton	@ 12.00
White Wringer Rolls, ℔ lb.	@ .03¾
White Syringes, ℔ lb	@ .03¾

Trade Notes.

Joseph Dixon Crucible Company, Jersey City, N. J., are putting the Cycle Chain Graphite on the market, which is the highest grade graphite reground with lubricating oil, and when applied to the chain of a bicycle, it is stated, penetrates the bearings and thoroughly lubricates and protects them from wear and rust. The same firm will soon put on the market the same material in the form of a solid stick, so that wheelmen can carry it in their tool bag.

The Rapid Safety Filter Company, 1343 Broadway, New York, are showing a variety of designs of their Filter, which filters the water passing through and cools it without letting it come in contact with the ice used for cooling. It will cool the water used, it is said, as fast as it will run from the faucet.

The advertisement of George H. Bell & Co., 114 and 116 Nassau street, New York City, directs attention to the Peerless Steam and Hot Water Heater. The announcement is made that this is the heater formerly known as the Schimpf Boiler, but the entire property and plant having recently been purchased by a syndicate, the name of the boiler has been changed to the Peerless.

A card in another column directs attention to the goods manufactured by the St. Louis Corrugating Company, 515 North Main street, St. Louis, Mo. This firm manufacture Sheet Metal Roofing, Siding and Ceiling of all descriptions from Sheet Iron or Steel, either black, painted or galvanized.

An advertising card issued by Fox & Fox, Isabella Building, Van Buren street, Chicago, Ill., calls attention to their business, which is that of glass brokers.

The Totten & Hoog Iron & Steel Foundry Company, Pittsburgh, Pa., manufacturers of Rolls and Rolling Mill Machinery, are operating their plant night and day. This firm are furnishing all the Mills, Shears, Engines and Boilers for the Emlyn Steel & Tin Plate Company of Summitville, Ind. They have just received an order from the Cumberland Steel & Tin Plate Company of Cumberland, Md., for three 24-inch Hot Mills complete, and an order from the Whitaker Iron Company, Wheeling, W. Va, for a large Double Shear and Engine; an order from the Morewood Company of Gas City, Ind., for a large Muck Shear, and an order from the Ohio Falls Iron Company of New Albany, Ind., for 22 Rolls.

E. E. Souther Iron Company, St. Louis, Mo., call attention in a card on another page to their Iron and Steel Roofing, and ask the trade to send for prices.

A meeting of the stockholders of the Joseph Dixon Crucible Company was held at their office in Jersey City, N. J, April 16, and out of 7345 shares 7215 votes were cast for the same board of management that has conducted the affairs of the company. The board elected consists of E. F. C. Young, John A. Walker, Daniel T. Hoag, Richard Butler, William Murray, Joseph T. Bedle and Jerome Gillett.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

The Detroit Heating & Lighting Company have received the contract and are putting in a plant for the lighting of the court house at Newark, Ohio.

The plans and specifications of the Oleson Block to be erected at Fort Dodge, Iowa, have been completed. It will be a three-story brick building, heated by steam, and will be furnished with all the modern conveniences.

The plumbing of the United States Post Office building in course of construction at Staunton, Va., has been let to Ed. Murray at a contract price of $2250.

Boyd & Schnaier, 347 Columbus avenue, New York, are doing the plumbing and gas fitting in the Montifiore Home, at Thirty-eighth and Hamilton streets, New York. They have just completed the contract for a new plumbing system, steam heating and marble work in the ten-story building at Broadway and Prince street.

G. Eaton will erect on Fulton street near Kedzie avenue, Oak Park, Chicago, a $6000 apartment house, to have exposed plumbing, steam heat and gas grate.

Hayward & Reynolds, 335 Columbus avenue, New York, are doing the plumbing work in the Empire Hotel, at Sixty-third street and Columbus avenue. The Durham system of house drainage will be used.

Wm. G. Morris, Frankfort, Ind., has the contract, amounting to $1000, for the plumbing work in connection with the Delphir water works extension. Sixteen hundred feet of 4-inch main will be laid.

In Cornelius Vanderbilt's Newport villa at Newport, R. I., which he calls "The Breakers," 25,000 feet of

the Newport indirect radiators are used and 10,000 feet of the same radiators are used in the chateau of Geo. W. Vanderbilt, at Biltmore, N. C. The radiators are made by the A. A. Griffing Iron Company, Jersey City, N. J.

The E. Keeler Company of Williamsport, Pa., have just completed the heating of the Y. M. C. A. and the Republican Club buildings in that city. In the former building a Boynton hot water boiler was used for service in connection with the swimming pool, and a Keeler 60 horse-power tubular boiler for the general heating. In the latter building a Boynton steam boiler for general heating and a hot water boiler of the same make, for bathroom purposes, were used. In both buildings the radiators were of the American Radiator Company's make. The company are at present engaged in the heating of the City Hall and Council Chambers, using one of their 60 horse-power tubular boilers and Corry radiators.

N. C. Harvey & Co., Duluth, Minn., are to install two Gurney hot water heaters in residences at Duluth.

The Walcott Hurlbut Company, 175-177 Lake street, Chicago, have received an order from Hamilton Bros., Marion, Ind., for a Syphon Eduction closet range, to be placed in a school building.

Cook & Chick, 253-255 Kinzie street, Chicago, have taken contracts for the steam heating in the apartment building of Charles Gloeckler, 583 La Salle avenue, and the store and flat building of M. Friend, 1047 Milwaukee avenue.

The J. L. Mott Iron Works 311-313 Wabash avenue, Chicago, are to place a No. 3 Star warm air furnace in the flat building of H. G. Byers, 76 Aberdeen street, and one of the same heaters in the residence of Nicholas Traft, South Evanston, Ill.

George C. Stevens, Columbus, Wis., is fitting up the residence of ex-Governor J. F. Lewis with a Gurney hot water heater and radiators.

The Board of Aldermen of Somerville, Mass., at its last meeting passed resolutions appropriating the sum of $14,000 for a four-room addition to the Knapp school house, to be borrowed on funded debt account, and authorizing the making of a contract with A. A. Sanborn for the heating and ventilating of the Geo. W. Durell school house.

The W. F. Porter Steam Heating Company, Minneapolis, Minn., have closed contracts with W. Ellithorpe, 3132 Stevens avenue, and Peter Jurgenson, Tenth avenue S. and Eighth street. The former will have hot water system and the latter steam. The Page boilers will be put in both residences.

The Lawrence Plumbing & Heating Company of Lawrence, Kan., have been awarded the contract for the plumbing and steam heating for the new county court house and jail at McPherson, Kan.

M. J. Corhoy, 78 Dearborn street, Chicago, has the plumbing in the flat building of Heissler & Junge, Thirty-fourth and State streets; residence of Joseph Slogel, Belmont avenue, and flat building of E. Stanton, 330 Ohio street.

Architects Faber & Pagels, Chicago, have designed a new Methodist church to be erected at the corner of Northwestern avenue and Cortland street. The building will be provided with a slate roof, kitchen and furnace heat.

Architect Cecil S. Corwin, Chicago, has designed for H. S. Mitchell a two-story attic and basement residence to be erected at Racine, Wis. The interior will be finished in hardwood and heated by hot water.

C. J. Hamhleton, Chicago, will construct a four-story store and apartment building at the northeast corner of North Clark street and Belmont avenue after plans by Architect G. L. Hallberg. Steam heat will be used.

Architect Frank L. Wright, Chicago, has designed for R. W. Roloson four two-story houses to be built on the east side of Calumet avenue, near Forty-second street. Hot water will be used for heating.

Architect A. F. Hussander, Chicago, has designed for T. F. O'Neil a large apartment house to be built at the intersection of Lincoln avenue and George street. It will be constructed of pressed brick and stone, with ornamental metal trimmings, and be heated by steam.

Architect W. J. Van Kuren, Chicago, has designed for J. E. Decker a three-atory apartment building to be erected on Park avenue, near Grove street, in Austin, Ill. It will be heated by steam.

Architect J. H. Huber, Chicago, has prepared plans for a residence to be erected on Newport avenue, near the lake. The building will be heated by hot water.

Among the contracts recently taken for steam heating by the Kelly & Jones Company, 48 to 52 North Clinton street, Chicago, are the following: O. Scheunemann's building, Belmont avenue and State court, and residence of Henry J. Luders, 217 South Leavitt street.

The D. S. Morgan Boiler Company, 22 West Lake street, Chicago, have contracts for steam heating in W. M. Grant's block on Michigan avenue, and in the residences of Mrs. E. M. Drew, Mrs. M. Hitt, H. B. Waterman and Tribelcock & Halligan, South Chicago.

The John Davis Company, 69 to 79 Michigan street, Chicago, have the contract for hot water heating in the flat building of Giles Hubbard, Forty-fourth street and Indiana avenue.

Coe & McMillen, Monticello, Ill., have been awarded the contract for steam heating in the new school building to be erected at Monticello.

Avery Stamping Company, Cleveland, Ohio, who are known as pioneers in heavy metal stamping, are putting on the market a full line of stamped steel hollow ware and are in a position to fill orders promptly. The line includes solid and riveted handle spiders, solid and riveted handle cake griddles, bailed cake griddles, round, flat and pit bottomed kettles, maslin kettles, stew pans, Scotch bowls, stew pots, hotel steel stew pans and pots, also pure nickel hotel sauce pans. The goods are furnished either polished, tinned, mirror polished or enameled, and are described as light, strong, durable, clean and of attractive appearance. The first cost of these goods is referred to as being far below copper and as rapidly replacing the same. The company also furnish the goods polished on the inside for what is called grease cooking. Attention is called to the nickel sauce pans, and while they are a little more expensive at first cost than copper, they are guaranteed by the manufacturers for 8 or 10 years. Emphasis is placed upon the finish and quality of the entire line of these goods.

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Metal and Miscellaneous Prices.

CHICAGO, APRIL 19, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100 ℔	6.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
A. V. Grade. IC, 10x14, 14x20	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—

IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25

Worcester Brand and equal.—

IC, 14 x 20	6.12½@
IC, 20 x 28	12.25 @
IX, 14 x 20	7.62½@
20 x 28	15.25 @

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20	$7.00
IX, 10 x 14, 12 x 12, 14 x 20	9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Palm, IC, 20 x 28	@$11.25
Palm, IX, 20 x 28	@ 14.00
Empire, IC, 20 x 28	@ 12.00
Empire, IX, 20 x 28	@15.00
Hickory, IC, 20 x 28	@ 12.50
" IX, 20 x 28	@ 15.50
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily conted), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Westmoreland: IC, 14 x 20	$6.00
IC, 20 x 28	12.00
Elwood: IC, 20 x 28	$11 50
Furnston: IC, 20 x 28	$11.00
Juno: IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method: IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie: IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	18.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00
Old Process: IC, 14 x 20	9.25
IX, 14 x 20	11.25
IC, 20 x 28	18.50
IX, 20 x 28	22.50
H. B. L., Old Style: IC, 14 x 20	7.75
IX, 14 x 20	9 25
IC, 20 x 28	15.50
IX, 20 x 28	18.50

Sheet Iron—

Black.

Nos.	Common American	Refined.
10 to 16	℔ 2 3-10¢	3 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5 10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis.75%

Copper—

Ingot.

Lake.....11¢ @ 11¼
Casting Brands.....10¢ @ 10¼

Sheet and Bolt.

Discount on old list, 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes. Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.34
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ¾ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....4¾¢
800 ℔ casks.....5 ¢
Loose sheets.....5½¢

Lead—

Soft Pig Lead.....4 ¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½@½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....13¢
Hallett's.....12¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	60&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	70&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	62½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles: Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1½¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6½¢
" Ground in oil, Red	℔ D, 6½¢
" Ground in oil, Brown	℔ D, 5½¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in oils	54¢
Linseed Oil, Raw, in bbls	51¢
Mineral Paints	2@4¢
Orange Mineral	9¼¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¼¢; kegs	7¾¢
Sipe's Japan Oil, in bbls, ℔ gal	84¢
Spirits Turpentine, in bbls., ℔ gal	34½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, APRIL 20, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:

Small lots	℔ D, 75¢
100-℔ lots	℔ D, 73¢
Ton lots	℔ D, 70¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots	℔ D, 70¢
100-℔ lots	℔ D, 65¢
Ton lots	℔ D, 60¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	℔ D, 65¢
100-℔ lots	℔ D, 60¢
Ton lots	℔ D, 55¢

Antimony—

Cookson	℔ D, 10¾¢
Hallett's	℔ D, 9¾¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894

Plain Round Tube.	Per ℔.
¾-in. up to 2 in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝ in.	.38
⅜-in. up to ½-in.	.41
5-16-in. up to ⅜ in.	.48
¼-in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3 in. and larger	Special
1½ in. to 3 in., to No. 19, inclusive	.38

25 @ 30%

Copper and Bronze Tubing—3¢ ℔ ℔ more than brass.

Conductors—

Corrugated. *Round or Square*—

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats...19¢ ℔ D, net

Ingot.

Lake	10½¢
Ansonia Grade Arizona	10 ¢
Ansonia Grade Casting	9¼¢

Planished......net
Sheet and Bolt......15¢ ℔ D, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized	60&10%
Lap or Slip Joint Terne	60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized.....85%

Stove-Pipe—

Buffalo Four-Piece.

4 in.	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20%

Elbows and Shoes—

Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.

Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2.50	2.80¢
Nos. 17 to 21	℔ D. 2.60	2.90¢
Nos. 22 to 24	℔ D, 2.70	3.00¢
Nos. 25 and 26	℔ D. 2.80	3.10¢
No. 27	℔ D. 2.90	3.20¢
No. 28	℔ D, 2.95	3.30¢
American B. B	℔ D, 4¢@4¼¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12¾¢
Patent Planished ℔ D. A, 10¢; B, 9¢ 5%
Craig Polished Sheet Steel.....℔ D 8½¢

Galvanized.

	B. B
Nos. 10 to 16	75@75&10%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig	3¾¢@4¢
Bar	4½¢
Pipe	5¾¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	6¾¢, 20%
Old Lead in exchange, 2½¢ ℔ D.	

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	10%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ochar, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil: Raw, ℔ gal	@ .40
Boiled	@ .48
Spirits Turpentine: In bbls	@ .82
Putty: In barrels and ¼ bbls	.01¾ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01¾ @ .02¼
In bladders	.01¾ @ .02¼

Roofing Material, &c.:

Asphaltum, Trinidad Refined, ℔ ton	$30.00@$35.00
Asphaltum, Rock, ℔ ton	$14.00
Coal Tar Felt, 1 Ply, ℔ D	2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft.	$1.85
Roofing Pitch, ℔ bbl	$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 Inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼¢	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.22@$1.23
Rosin, E. & F..... ₩ bbl. $1.35@$1.55
Rosin, G. & H..... ₩ bbl. $1.75@$2.15
Rosin, I. & K..... ₩ bbl. $2.35@$2.60
Rosin, M. & N..... ₩ bbl. $2.85@$3.00

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:

Best Bangor, ₩ sqr	$3.25@$4.50
Pen Argyle, ₩ sqr	3.50@ 4.25
Peach Bottom, ₩ sqr	6.00@ 6.25
No. 1 Chapman, ₩ sqr	4.00@ 4.65
Lehigh Slates, ₩ sqr	3.00@ 4.50

Vermont:

Sea Green, ₩ sqr	2.70@ 3.20
Purple, ₩ sqr	3.50@ 4.50
Unfading Green, ₩ sqr	3.50@ 4.00
Red, ₩ sqr	9.75@12.00

Solder and Soldering Fluids—

Solder—

¼& ¼..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barral; money refunded when returned.

Perfection Soldering Flux.
No charge for package.

Bbls., about 500 ℔, ₩ ℔	3½¢
½ bbls., about 300 ℔, ₩ ℔	4¢
Kegs, about 110 ℔, ₩ ℔	4¢
75¢ extra for keg.	
Kegs, about 55 ℔, ₩ ℔	4¢

5% dis.

Yager's Soldering Salts.
½-℔ bottles, each..... 80¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢
Bertha (pure)..... 8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 21¾¢
Straits, pigs, ₩ ℔..... 21¢ @ 21½¢
Straits in bars, ₩ ℔..... 22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20	$7.00
Alderly, extra quality, IC, 14 x 20	6.87½
Allegheny, IC, 14 x 20	6.12
" IX, 14 x 20	6.38
Apollo Roofing, IC, 14 x 20	5.50
" " IX, 14 x 20	6.50
Atlantic, IC, 14 x 20	5.75
Bonus, Extra Coated, IC, 14 x 20	6.75
" " IX, 14 x 20	8.25
Buckeye, IC, 14 x 20	7.00
" IX, 14 x 20	8.25
Chicago, IC, 20 x 28	11.50
Central, IC, 14 x 20	5.87½
Climax, IC, 14 x 20	5.50
Columbia, IC, 14 x 20	7.00
Crescent, IC, 14 x 20	6.00
Dane, IC, 14 x 20	5.50
DeMilt's First New York, IC, 14 x 20	5.75
" First New Jersey, IC, 14 x 20	5.50
" Mohawk, IC, 14 x 20	5.50
Dunlap's Double Dipped, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.50
" Domestic, IC, 20 x 28	12.00
" " IX, 20 x 28	15.00
Empire, IC, 14 x 20	6.12½
Extra Central, IC, 14 x 20	5.62½
Flag, IC, 14 x 20	5.25
Fort Pitt, IC, 20 x 28	11.00
Globe, IC, 14 x 20	5.75
Hamilton's Best Redipped, IC, 14x20	9.25
" " IX, 14x20	10.75
Hickory (Resquared), IC, 14 x 20	6.25
Juno, IC, 14 x 20	5.75
Kensington, IC, 14 x 20	6.75
" IX, 14 x 20	8.00
Knoxall, IC, 14 x 20	6.00
Laufman's Apollo (Resquared), IC, 14 x 20	8.12
Laufman's Apollo (Resquared), IX, 14 x 20	9.37
Leominster, Extra Coated, IC, 14x20	7.25
Lion (Stamped), IC, 14 x 20	6.25
Lula, Best Charcoal, IC, 20 x 28	12.50
" " " IX, 20 x 28	16.00
Manhattan, IC, 14 x 20	7.00
Maple, IC, 14 x 20	6.50
Merchant's Old Method (Resquared), IC, 14 x 20	9.50
Merchant's Roofing (Resquared), IC, 14 x 20	8.50
McKinley, IC, 20 x 28	12.00
" IX, 20 x 28	15.00
Newcastle Real Old Method, IC, 14x20	9.50
" " " IX, 14x20	11.50
Newcastle Genuine Extra Coated, IC, 14x20	8.75
" " " IX, 14x20	9.75
Newcastle Shenange, IC, 14x20	6.12½
" " IX, 14x20	7.62½
Neville, IC, 14 x 20	6.00
" IX, 14 x 20	7.25
N. F. Old Style, IC, 14 x 20	7.50
" " IX, 14 x 20	9.00
Old Colony, IC, 14 x 20	8.00
Optimus, Best Redipped, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.50
Osceola, Hand Coated, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.75
Pacific, IC, 14 x 20	5.25
Palacio, IC, 14 x 20	5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20	8.00
Phœnix, IC, 14 x 20	5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20	9.25
Scott's Extra Coated (Resquared), IX, 14 x 20	10.75
Taylor Old Style (Resquared), IC, 14 x 20	9.25
Taylor Roofing, IC, 14 x 20	8.00
Thomson's Puritan, IC, 14 x 20	5.75
Tip Top, IC (Resquared), 14 x 20	6.62
" IX " 14 x 20	7.88
U. S. Monongahela, IC, 14 x 20	6.10
U. S. Redipped, IC, 14 x 20	8.25
Venus, IC, 14 x 20	5.87½
Vigilant, IC, 14 x 20	5.50
Waldo Redipped, IC, 14 x 20	6.75
Westmoreland, IC, 14 x 20	6.25
Wilkinsburg Redipped, IC, 20 x 28	16.00
" " IX, 20 x 28	19.00
Willow, IC, 14 x 20	6.25

American Bright Plates—

Almond, IC, 14 x 20	$6.25
Brilliant (Tissue Packed), IC, 14x20	9.00
Climax, IC, 14 x 20	6.00
" IX, 14 x 20	7.50
Florence, IC, 14x20	6.75
Hazel, IC, 14x20	5.80
Iowa, IC, 14 x 20	5.75
" IX, 14 x 20	7.00
Lladeu, IC, 14x20	6.50
Merchant's Dipped, IC, 14x20	11.00
Merlon, IC, 14x20	6.75
Mint, IC, 14x20	6.00
Newcastle Russia, IC, 14 x 20	7.00
" IX, 14 x 20	9.00
Newcastle Juniati, IC, 14 x 20	6.50
" IX, 14 x 20	8.50
Newcastle Best Coke, IC, 14 x 20	6.00
" " IX, 14 x 20	7.25
Newcastle Coke, IC, 14 x 20	5.50
" IX, 14 x 20	6.75
Palma Xtra, IC, 14x20	7.00
Phœnix, IC, 14x20	6.25
" IX, 14x20	7.75
Royal, Extra, IC, 14x20	7.00
U. S., IC, 14x20	7.25
Versailles, IC, 14 x 20	5 75
Youghlogheny, IC, 14 x 20	6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20	$7.50
20 x 28	15.00
IX, 14 x 20	8.75
20 x 28	17 50
Pontymister Grade, IC, 14 x 20	6 50
20 x 28	13.00
IX, 14 x 20	7.50
20 x 28	15.00
Worcester Grade, IC, 14 x 20	6.75
20 x 28	11.50
IX, 14 x 20	6 75
20 x 28	13.50
Dean Grade.—IC, 14 x 20	$5.37½
20 x 28	10.70
IX, 14 x 20	6.40
20 x 28	12.80
Abercarne Grade.—IC, 14 x 20	5.25
20 x 28	10.50
IX, 14 x 20	6.40
20 x 28	12.80

Imported Bright Plates—

Charcoal.
Dnty: 2.2¢ ₩ ℔.

Melyn and Cal-		
land Grade.	IC, 10 x 14	$6.37½
" "	IC, 12 x 12	6.62½
" "	IC, 14 x 20	6.37½
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.87½
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
"	IX, 20 x 28	14.00
"	DC, 12½ x 17	6.50
"	DX, 12½ x 17	6.50

Coke.

Steel Coke.—IC, 10x14, 14x20	$5.25@$5.35
10x20	8.12½
20x28	11.00
IX, 10x14, 14x20	6.60
B. V. Grade.—IC, 10x14, 14x20	6.40

Imported Boiler Plates

IXX, 14x26..(112 sheets)	$13.35
IXX, 14x28..(112 sheets)	14.50
IXX, 14x31..(112 sheets)	16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 25@30%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz..... 18.00

Wrought Iron Pipe—

1¼ and under, Plain..... 60&10&5%
1¼ and under, Galv..... 52½&10&5%
1½ and over, Plain..... 70&10&5%
" and over, Galv..... 60&10&5%
Boiler Tubes, list Oct. 24, 1892..... 70&10&5%
Casing, list Nov. 16, 1892..... 52½%
Inserted Joints Casing, list Nov. 16, 1892..... 47½%
Steel Boiler Tubes..... 27½%
Cold Drawn Seamless Steel Tubing..... 50%

Zinc—

600 ℔ casks..... ₩ ℔ 4½¢
Per ℔..... 5¢ @ 5¼¢

It Is Reported—

Alabama.

That R. A. Posey has recently commenced the Hardware business at DADEVILLE.

California.

That J. W. Morrison has sold his Hardware store at SANTA ANNA to S. C. Wright of MCPHERSON, KAN., receiving in payment therefor a section of Kansas land and other considerations. Mr. Wright will conduct the business under his own name.

Colorado.

That Judge Walter T. Brown, for years engaged in the Hardware business at FORT MORGAN, but a resident of DENVER the past eight months, has purchased an interest in the Mitchell-Patton Mercantile Company.

Connecticut.

That on the afternoon of the 14th inst. fire broke out in the attic of the establishment of the Way Hardware Company, HARTFORD, and an hour later when the flames were extinguished the stock in the store below had been damaged by water to the extent of about $10,000. The company carry a stock of nearly $25,000, and a good portion of this was thoroughly drenched. Rubber blankets were placed over the stock as far as possible, but the water came down in such floods that scarcely anything could be kept dry. The loss is fully covered by insurance.

Delaware.

That the large Hardware stock of Bellah & Co., WILMINGTON, has been disposed of at auction.

Georgia.

That the Hutchinson Lumber & Supply Company of CORDELE are intending to engage in the Hardware and mill supply business, doing both a retail and wholesale trade. W. B. Hutchinson is president of the company, C. E. Arnt, treasurer; A. Kirtland, general manager, and J. W. Moore, secretary.

Illinois.

That T. E. Peck has opened a new Hardware store at VIRGINIA. He will also carry Tinware and Stoves.

That S. J. Stebbins' Hardware store, at 39 Van Buren street, CHICAGO, was damaged by fire on the 9th inst.

That German & Friedman of PRINCEVILLE have bought out the Hardware and Implement business formerly operated by Mr. Moore, at BRIMFIELD.

That T. B. Bray has sold his interest in the Hardware store at ELIZABETH to his partner, H. Weir. Mr. Bray will probably enter the dry goods business in the near future.

That Burder & Co. are proprietors of a new Hardware store at ORION.

That the residence and Hardware store of F. Webber, FAIRBURY, were destroyed by fire on the 8th inst.

Indiana.

That the Hardware store of William M. Johnson, at ILION, was entered by burglars on the 10th inst., the safe broken open and $300 stolen.

That fire on the 5th inst. destroyed the stable and warehouse of J. B. Barnes, Hardware merchant, of ANDERSON. The loss was $2000, with no insurance.

Iowa.

That arrangements have been perfected so that Gortner & Burt are again conducting their Hardware business at LAKE CITY.

That burglars broke into John F. Hays' Hardware store, at CLINTON, on the 6th inst., and stole goods to the amount of nearly $200.

That Mr. Stalford of DES MOINES has purchased G. F. Brayton's Hardware store at PERSIA.

That Wilber Van Cleef has bought the Hardware store formerly owned by W. J. Wood, ELLIOTT.

That Ford & Bailey is the style of a new Hardware store at DUNCOMBE.

Kansas.

That the Hardware store of F. B. Orr, HARPER, was burglarized a short time since. About $100 worth of goods were stolen.

That C. W. Young, dealer in Hardware and Implements, GREENLEAF, has sold his stock of Hardware to C. O. Graves. Mr. Young will continue the Implement business.

That C. S. Lucas of MARYVILLE, Mo., has decided to open a Hardware store at ARGENTINE about May 1.

Maine.

That Kelley & Eastman's Hardware store, at RANDOLPH, was entered by thieves on the 9th inst. and $150 worth of goods taken.

That John Watson, Hardware merchant, of HOULTON, is building a large storehouse 50 x 150 feet.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, April 28, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Heating from Central Stations.

The heating of buildings distributed over wide districts from large central stations has been on trial in New York and other big cities for a sufficient time to give an answer with reference to the profitable or unprofitable character of the business. The financial results are generally believed not to have been satisfactory to investors in a number of these enterprises; yet, within certain reasonable limits, there is nothing apparent that would render a system of heating from a central station incapable of yielding a fair profit. The chief mistake appears to have been in the attempt to include too much in a single installment. It is not to be denied that however well steam pipes may be protected by insulating covering, any increase of their length from the steam generator to the place at which they deliver their steam increases the expense of supplying steam to that place. It is possible to conceive a steam pipe so long that all the steam which could enter it and flow through it under high pressure from a steam boiler would be condensed to water before reaching the extremity of the pipe. It is not probable that in any of the large plants referred to this limit has been reached; but there can be no doubt in some instances pipes have been laid underground to such distances as to condense a large percentage of the steam they conveyed before it reached its point of useful application.

Smaller Installments Suggested.

The question arises as to what great advantage can be gained by attempting so much from a single central station, even were it possible to reduce the loss through condensation to an amount comparable with the loss experienced with good practice in ordinary steam heating plants. A central station requires a certain amount of land to accommodate boilers and provide for a storage of coal. Suppose it to occupy one or two city lots. The amount of boiler power that could be accommodated thereon, with allowance for needful storage, would not be more than sufficient to supply to a few large blocks of city buildings the steam required for heating, elevators and other purposes. Now if it be required to supply a similar quantity of steam to buildings further away, is it not a common sense view that it is better to establish another central station at a distance from the first, rather than buy adjacent lots and build on one plat a plant large enough for both districts, thus increasing the cost of pipes for distribution, subjecting the enterprise to largely increased losses of heat, and also increasing the engineering difficulties in the construction and maintenance of the plant in working order? Many engineers asserted that this was the common sense view years ago, when the great heating schemes were first projected; and experience has proved the wisdom of this view.

Gas for Cooking.

The practicability of gas for cooking is demonstrated by its use to the exclusion of any other fuel in many apartment houses. In some of the handsomer houses in which a suit of seven or eight rooms rents for from $50 to $100 a month no other means for cooking are furnished. Compared with the kitchens of the past, these tiled and decorated culinary apartments, with modern cooking apparatus, are wonderfully attractive. The satisfaction attending the use of gas is illustrated by the experience of a furnisher who supplied 49 ranges in a new house, and though the tenants had never cooked with gas, but two out of them all insisted on having coal ranges; and on the arrival of summer these two were eager to secure gas ranges. The change was not a little influenced by the servants, who learned from those who used gas ranges how convenient and free from heat they were. A manufacturer of gas ranges who was desirous of comparing the cost of fuel for cooking employed the janitor in one of these large houses to make a canvass and learn the amount paid for gas. He found the average to be about $5 per month, including what was used for lighting, with the gas at $1.25 per 1000 feet.

The Armies of Unemployed.

The organization of unemployed men and tramps into so-called armies to march over the country is an entirely new idea. It will hereafter be referred to in history as originating after the panic of 1893. The movement seemed insignificant at first, and Coxey's march to Washington was regarded as a joke to enliven the columns of the newspapers for a few days and was then expected to pass into utter oblivion. But the events of the last few days have put a much more serious aspect on the situation, and there is promise of enough happening to make future historians inquire closely into the causes, progress and results of this curious manifestation of unrest. At the present time there are some eight or nine "armies" struggling to reach Washington from various parts of the country. In a numerical sense these "armies" form no special menace to the order and peace of the country. There are too few of them and they are too widely scattered to do much damage. They may cause annoyance to the towns through which they pass, but such towns are but a small part of the country as a whole. As long as the "commonwealers" or "industrials," or whatever they may be termed, are so few in number they can do no particular damage even if some of their leaders indulge in very foolish talk. Experience has shown, however, that when there are many workmen idle some join the professional loafers and hoodlums in starting riots in large cities which cause much destruction to property. The incentive is frequently quite light. The railroad riots of 1877 would not have been so serious and disastrous if the trouble had been confined to those immediately interested. But idle workingmen and the riffraff of cities, always eager for turbulence, took up the cause of the disgruntled railroaders, made common cause with them and carried the conflict far beyond the anticipation of the leaders of the original strikes.

It is asserted upon good authority that at present prices there is no profit attached to galvanizing steel sheets. Manufacturers are contented, perforce, with a fair profit on the black sheets and go to the trouble of galvanizing in order to find a market for the products of their mills. An effort is being made to get all galvanized iron manufacturers into the Galvanized Iron Manufacturers' Association, for the purpose of maintaining better prices, but there are a few who have not yet signified their intention and independet action continues.

Ex-President Harrison, in concluding his course of law lectures at the Stanford University of California, gave the students some advice which is significant as coming from so competent a source. He counseled them to "stick to their profession, avoid politics and never seek office."

Negotiations are, it is said, pending for uniting the independent cordage interests of the country with the United States Cordage Company.

THE LETTER BOX.

Protection for Copper Cornices.

From J. F. F., *Savannah, Ga.*—Will *The Metal Worker* inform me what is the paste used to put on copper to keep it from tarnishing while it is being worked into a cornice, and what should be used for cleaning after the cornice is made? There are various ways of cleaning copper, but when the hands are placed on it the place touched soon discolors. If the cornice is cleaned after it is made, while putting up it is again covered with finger marks. What I want is something to keep the copper clean while it is being made up.

Note.—We shall be glad to hear if any of our readers have been successful in overcoming this difficulty. The use of lacquer for coating the material and gloves have been suggested, but are not found to be generally used. The common method of cleaning copper work is to scour it with fine pumice or emery made into a paste with oil, so it will not blow away. The powder is removed by polishing with some soft material, and if it has made no scratches and the corrosion has not been too deep, a clean, bright surface is left. This can either be done before or after the work is in position on the building. With this material there is nothing to start discoloration anew, and the surface is left to take the color naturally resulting from exposure.

Lukewarm Water.

From J. R. F., *Southington, Conn.*—Referring to the letter of "C. D. F." in *The Metal Worker* of April 14, would say that I have had the same trouble which he reports and found it to be due to impeded circulation in the pipes. If he will take down the boiler he will find the bottom pipe full of sediment, especially if the boiler has been in use a number of years. It is possible, also, that he will find that the tube which connects with the cold water supply inside of the boiler has rusted off and dropped out of place, so that the cold water mingles with the hot.

Seeking Education.

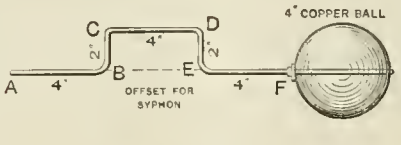
From SUBSCRIBER, *Washington, D. C.*—I notice your article in *The Metal Worker* of April 7 on the subject of self education. Please give names of books you would recommend and the most important studies, or with whom can I correspond for information.

Answer.—We would be glad to assist our correspondent in mentioning books for reading or study, but he has not told us what line he wishes to pursue. Of course he knows that the groundwork of all education is the usual school studies of arithemetic, geography, natural philosopy, history, &c. But we should imagine that he was looking for instruction in some particular trade, and it would be quite useless for us to give him a list of works on electricity, for instance, if he were seeking self education in plumbing. If our correspondent wishes to take a regular course of this sort we would advise him to write to the Correspondence School of Mechanics and Industrial Sciences, Scranton, Pa., who give instruction by mail in a great number of different branches.

Straight and Crooked Levers.

From APPRENTICE, *London, Ont.*—I am a reader of *The Metal Worker* and an apprentice at the plumbing trade, and will be obliged to you for an answer to the following: Does the offset on a ball cock lever add to its power in action? In the accompanying sketch the length of the lever is 16 inches. Would not a lever from A to F 12 inches long be just as powerful?

Answer.—Our correspondent's view of the matter is correct. A ball



Straight and Crooked Levers.

cock arm is simply an ordinary lever with the fulcrum at A and the power applied at F, which is the point at which the buoyancy of the copper ball acts on the lever to force it up. The power of a lever of this sort depends on the distance between the application of the force and the fulcrum, and it practically makes no difference what the shape of the lever is. The offset, therefore, does not increase or diminish its efficiency. We, of course, assume that the lever arm is rigid.

Boiler Rumbles.

From E. W. Y., *Pawling, N. Y.*—I would like to have explained through the columns of *The Metal Worker* what causes and how to remedy the rumbling noise in a range boiler when hot water is drawn out. Should the cold water pipe from the boiler to the range be lower at the range?

Answer.—In *The Metal Worker* of January 27, February 3 and March 17, an explanation is given of the cause of the rumbling noise. It is due to the generation of steam in the water back and its passage to the boiler, where it condenses, and the water rushing in to fill the space that was occupied by the steam makes the noise. A remedy used in a number of cases is a pipe called a relief pipe, running from the top of the boiler to the top of the tank, where it turns over so that the steam generated may pass off as fast as it is made and the noise be avoided. Owing to surrounding conditions it is not always possible to so set a boiler that the pipe running from the boiler to the range will be lower at the range, but where it can be done it is undoubtedly the better plan.

Wants an Insulator.

From E. T., *Wyncote, Pa.*—Can you tell me a good way to pack or wrap pipes to prevent them from freezing, where they must be run up on the outside of a building?

Answer.—The most satisfactory way to protect pipes from freezing is to box them in and fill the space around them with some non-conductor of heat. The large tanks on the top of high buildings in New York City which supply the buildings with water have a pipe that leads from the tank down through the roof, and the length of exposed pipe varies from a few inches to some feet. A very common practice is to box these pipes and fill the space with sawdust. Sometimes mineral wool or asbestos is used, and at other times the pipes are securely wrapped with several thicknesses of hair felt.

Chimney Condensation.

From R. C., *Fillmore, N. Y.*—Will *The Metal Worker* please inform me what makes the black liquid run from a furnace smoke pipe where the pipe is long and runs up through the house, and if there is any way to stop it? We have pipes that give considerable drip from condensed smoke, especially when wood is burned.

Note.—The black liquid mentioned is due to condensation in the chimney or smoke pipe, caused by the contact of the smoke and vapors with bodies that are colder than they. In a great number of cases this is due to a lack of draft and also to the size of the chimney. It has been asserted by some practical men who have had experience in this line that a chimney less than 8 x 12 will not give satisfaction where wood is used as a fuel. To prevent the drip coming to the outside of the pipe a common method of putting up the pipe is to reverse the connections, so that the smaller end of the pipe fits inside the stove collar and the other end receives the smaller end of the next joint of pipe, and so on to the chimney. This permits the condensation to run back toward the stove, without escaping at the joints.

Roofing Material Wanted.

From J. D. G., *Bozeman, Mont.*—In *The Metal Worker* of April 7, "M. H. R," Winnipeg, asks for suggestions on metal roofing. Without attempting to solve the problem, I would say that the climate he describes is the same as ours, and the roof that gives the best satisfaction here is the standing seam tin roof. The better the tin the better the results. Our roofs, however, do not give us half the trouble that the gutters do, and I would like to know the very best material for gutters, regardless of cost. How would aluminum do? Can it be joined or soldered? I would like to hear from "M. H. R." or any one else in regard to this proposition.

Note.—The soldering of aluminum is the difficulty met with in making use of that metal. There are roof compositions manufactured, however, into which aluminum enters, which we believe are easily soldered and worked like other metals. The quality in a roof material to be sought for in climates where there are great extremes of temperature is small expansion. Zinc, for instance, would be very difficult to handle in such a climate. We believe, however, that any metal can be laid with satisfactory results if an ingenious roofer will allow properly for the expansion and contraction of the sheets. For instance, the method of laying zinc in ordinary climates, if applied to tin plate in the climate of Winnipeg, would probably give good results. We will be glad to have our readers discuss this whole question.

From THE METALLIC ROOFING COMPANY OF CANADA, LIMITED, *Toronto, Ont.*—In your issue of April 7 we notice a letter from "M. H. R.," Winnipeg, Manitoba, respecting roofing material suitable for that climate, which varies from 50° below zero to 100° in the shade. We manufacture materials especially suitable for the Manitoba trade and have sold large quantities without receiving any complaints. It is a roof of sheet metal, and full information may be obtained from J. H. Ashdown, wholesale hardware merchant, Winnipeg, who is our agent.

Wants to Build a Fruit Dryer.

From C. O. F. Y., *Glendale, Ariz.*—I would like some information with reference to the construction of fruit dryers, using both hot air and steam, from the readers of *The Metal Worker* who may be engaged or have had experience in the construction of such apparatus.

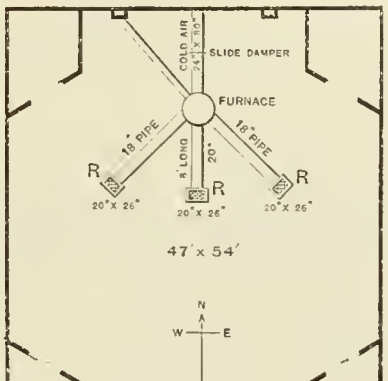
Sheathing for Tin Roofing.

From F. & H., *Brookville, Ind.*—In reply to the query from "B. J. P." in *The Metal Worker* of April 14, as to sheathing under tin roof, would say that tight sheathing would prevent tin from rusting on the lower side, but it would be more expensive than if the sheathing is laid a few inches apart, and it would be more difficult to work on a steep roof than if there was a space between the sheathing boards for a foothold. We use rosin sized or water proof paper under all our work and find that it prevents rust, is cooler in summer and warmer in winter, deadens sound and prevents drip of melting frost.

From C. F., *Erie, Pa.*—In reply to "B. J. P." of New York, in *The Metal Worker* of April 14, would say that by all means close sheathing is the best, at least when no felt is used. To illustrate the fact, only lately we had occasion to take off a tin roof for a new addition that had been on about five years on sheeting that was quite loose and having a good many knot holes, and as there was no felt on, we found that where the tin had been protected by the sheeting it was as bright as the day it was put on, while over the cracks and knot holes it was very rusty. I think there is the proof of the pudding. The only thing I would advise with close sheeting is to provide the attic with ventilation.

Wants Furnace Suggestions.

From A. L. F., *Roanoke, Va.*—In *The Metal Worker*, March 24, I notice that a Montana tinner asks for information in regard to setting his furnace. I submit a sketch and such information as I think would help him out in his dilemma. If I had the job of putting up this furnace I should locate it as shown by my diagram, taking it for granted that the south of the building was the entrance and north was the rear, and not built up against any other building in the rear. In the first place, three registers will equalize the distribution of the warm air in the room. The north and west side of the room will always be colder than the east and south. I would place the cold air flue on the north or northwest side of the building, which all furnacemen understand is the proper location. A damper should be placed in the cold air flue, as at times when the wind blows at a rapid rate it is necessary that some of the supply should be cut off, as a larger amount of air will be forced through the furnace than can be heated. By placing the furnace nearer the flue it will help the draft, and from the fact that the furnace is in the north of the building the hot air pipes can be extended some little distance without a material loss in heat. I would suggest that a round pipe be extended up the chimney, say, 10 or 15 feet, as large as the flue will admit (the entire length of the flue would be better), placing an elbow as large at one end as possible to receive the furnace pipe. Then plaster around the elbow, so as not to allow any air to enter the chimney flue without passing through the furnace. I should not advise using two flues. There might possibly be some trouble if one of the flues had a stronger draft than the other. Under some circumstances the one with the poorest draft would be a disadvantage.



Wants Furnace Suggestions.

I presume that soft coal is used from the size of the smoke pipe and the collar on the furnace. We are always ready to lay the blame on the chimney flue when the furnace smokes or there is a sluggish fire, though it is not always the cause of the trouble. If the furnaceman is a pretty good mechanic let him examine the check plates that are placed in the majority of furnaces and see if they cause the trouble. Some of the best makes of furnaces will not give satisfaction when using soft coal, owing to the draft of the chimney not being strong enough and the check in the furnace being too great. I have remedied three furnaces this winter that smoked so badly that the owners threatened to take them out, owing to the check being too great when using soft coal, causing them to smoke to such an extent as to be almost a nuisance. There is no danger in removing a portion of the check plate that the draft will be too great, as soft coal produces such an enormous amount of smoke and gas when it is first thrown in the furnace that it is almost compelled to force its way out through the door or some other part of the furnace that is not perfectly air tight, unless there is ample outlet for it to escape to the flue. In the matter of the cold air flue, as shown on his diagram, it seems to me to be a very bad idea to take the cold air from the main auditorium. While some furnacemen suggest this plan, the fact that the air is being reheated and sent back into the room to be inhaled, possibly a dozen times during services, does not commend itself to me as being the proper way to get fresh air, which is so essential where there is a large number of people. Although those who approve this plan contend that the air is purified by passing through the furnace, I have other ideas.

Material for Roof Gutters.

From L. H., *Masontown, Pa.*—I would like to know which is the more lasting for roof gutters—copper of ordinary thickness or the best grade of roofing tin.

Answer.—Roofing tin, as our correspondent knows, is sheet iron, or rather steel coated with a mixture largely composed of lead. The finished plate, therefore, is equivalent to a sheet of iron and two thin sheets of lead alloy. Copper is a single homogeneous metal. Assuming that the copper that our correspondent has in mind is of the same thickness as the finished plate of roofing tin, it is evident that copper will prove the more lasting material. The length of life of the roofing plate, of course, depends upon the endurance of the lead coating. When this is worn away, abraded, or injured in any way, the iron or steel quickly rusts through. We do not know the relative endurance of lead and copper. Suffice it to say that roofs covered with lead sheets or copper sheets will last indefinitely. It

is of little consequence in modern building construction whether a roof gutter lasts 150 or only 100 years. In either case it will be apt to outlast the house itself, so it is needless to define the exact limit of endurance. We have no doubt that if our correspondent uses the best terne plates for his roof gutters he will find they will prove very durable.

Ohio Sheet Iron Trade.

In sheet mills in Central Ohio and adjacent districts there is a much better feeling prevailing. Jobbers of the West, Northwest, and South are sending their inquiries broadcast asking for prices for summer and fall delivery, and they appear to have realized that bottom has been reached. If this is not a fact and prices do go lower they will hug the cost marks so closely that there will be no margins for contingencies, and a few breakages or stoppages will wipe out the small profits, obtainable only under the most favorable conditions. Considering the fact that jobbers are in the market and that the roofers are doing better business, there ought not to be any further decline in sheet iron prices. The fact that the fine weather of the past two weeks has stimulated building operations is given as a cause for improvement in the iron and steel roofing trade. At Canton, Wheeling, Cambridge and Cleveland it is reported that inquiries are more numerous, and more sales are resulting than at any time for six months past. The demand for conductor pipe, eaves trough, and other building material made from galvanized iron is particularly good, and rolling mills appreciate this fact. The bulk of the trade in roofing and corrugated sheets is in light gauges for small consumers. Orders for heavy gauges are few and far apart. This is accounted for by decreased construction of buildings for manufacturing purposes. An order for about 30 tons of Nos. 18 and 22 corrugated for covering the buildings of the Canton Rolling Mill Company, Canton, Ohio, was placed with the Canton Steel Roofing Company; the black sheets will be made at New Philadelphia. The buildings referred to will contain sheet mills, and it is estimated that the entire product will be consumed by home concerns.

According to the lately published census returns, the total valuation of property in the United States in 1890 was $65,037,091,197, which was an increase of 49.02 per cent. over the returns of 1880, representing a per capita sum of $1039. That the growth of the wealth of the country during the past five decennial periods has proceeded at a much higher ratio than the increase in population is shown by the following figures: In 1850 the total valuation of property in the country was a little over $7,000,000,000, or $308 per capita. In 1860 it was $16,000,000,000, or $514 per capita. In 1870 it was $30,000,000,000, or $780 per capita, and in 1880 it was $43,500,000,000, or $870 per capita. New York stands as by far the richest State, its wealth being estimated at $8,500,000,000. Pennsylvania comes second, with $6,000,000,000, and Illinois third, with $5,000,000,000.

Ground was broken on April 18 for the work of sewering the city of New Orleans.

Borough Polytechnic Institute, London.

In the early part of last year we presented an account of the then recently started trade training classes held in connection with the Borough Polytechnic Institute of London, England. This institute was the first established under an act of Parliament passed in 1891 to encourage technical education in Great Britain. It was opened in September, 1892, by the Earl of Rosebery, the present Prime Minister of England, with well equipped classrooms, halls, laboratories and offices for the efficient conduct of the general technical education and recreative advantages which it was designed to provide for the working men and women of the South London district, in which it is located. Its courses of instruction cover a very wide field, embracing the teaching of subjects to suit all trades and classes, thus aiming to promote greater industrial skill and general knowledge among the younger working people of the British metropolis.

Trade Classes.

Among the principal educational departments of the Borough Polytechnic Institute are the classes for practical and theoretical instruction in various trades. These trades include plumbing, sheet metal working, carpentry, engineering, blacksmithing, pattern making, bricklaying, bookbinding, &c. Instruction is only given to those already engaged in these trades, and is arranged to supplement the training of the factory or workshop and not to supersede it. For this reason no student is admitted for trade training only, but is expected to join at least one of the science or art classes, such as the elementary science class or the classes in practical geometry or technical drawing, which are open on nights other than those devoted to trade instruction. Thus it is intended to give the mechanic an all round training which will help him in his trade, by stimulating his mental faculties as well as his manual capacity.

The New Workshops.

The trade classes were at first housed, as a temporary measure, in the original institute building, until adequate accommodation and facilities could be provided. They soon outgrew the space there at their disposal, and it was decided to at once erect new workshops for the trades in a separate building. This was done, and the shops were completed and opened for use in March of this year. The plan view, presented herewith, gives a good conception of the arrangement of the different shops. All, with the exception of the bricklayers' and bookbinders', are top lit with lantern lights, the side sashes being hinged to open for ventilation. They cost $15,360 to build and nearly $6000 to equip. The students of the trade classes assisted in the work of furnishing and fitting them; sheet metal workers, carpenters, bricklayers, &c., contributing their labor and skill with good effect.

Progress of Trade Training.

The new and more capacious accommodation thus provided enables the managers of the institute to largely develop and extend the work of the trade classes, which have been found to meet a very pressing need in South London. Eighteen months of work have shown that the advantages offered are eagerly grasped by the class for which they were intended. The entries in the trade and technical classes for the first session were 497. In the last session—October, 1893, to May, 1894—they numbered 701, an increase of 264, and the prospects are that the next courses will be still more numerously attended.

Plumbing Instruction.

Instruction in plumbing is given on three nights of the week: Tuesdays, Thursdays and Fridays. The full curriculum extends over three years. The first year's course is a preliminary and general one, consisting of instruction in practical geometry, technical drawing, freehand and model drawing, and elementary mechanics, including mensuration This course is planned to serve as a preliminary for those about to enter or who are already engaged in any of the trades. Students, however, who have a knowledge of any two of the above named subjects are allowed either to take up other subjects or else to pass at once to the second year's course of the trade in which they are employed. In the plumbing trade, the further courses are arranged as follows:

SECOND YEAR'S COURSE.

Mondays, 8 to 10 p.m., plumbers' work (technical).
Thursdays, 7.30 to 10 p.m., special preliminary science course (lectures and laboratory work).
Fridays, 8 to 10 p.m., plumbers' work (practical).

THIRD YEAR'S COURSE.

Tuesdays, 8 to 10 p.m., plumbers' work (advanced technical).
Thursdays, 8 to 10 p.m., plumbers' work (advanced practical).
Fridays, 8 to 10 p.m., building construction and special lectures.

These courses, consisting of lectures and workshop practice, comprise instruction in lead bossing, pipe bending, soldering and wiping joints, &c.; lectures on sanitary arrangements in dwelling houses and other buildings, water closets and their fittings, baths, traps, lavatories and sinks; soil pipes, their ventilation and arrangement; water supply, house cisterns, roofing, &c.

In addition, a special class for journeymen and foremen plumbers and others engaged in the building trades is held on Monday evenings from 7.30 to 9 o'clock, when instruction is given in "builders' quantities," including measuring work, taking off quantities from drawings, squaring dimensions, and bringing the same into bill ready for pricing out to form a builder's estimate.

Sheet Metal Work.

The preliminary or first year's course for sheet metal workers in tin plate, zinc, iron and copper, lamp makers, boiler makers and coppersmiths is similar to that detailed for plumbers. The second and third year's courses are laid out respectively as follows:

SECOND YEAR'S COURSE.

Mondays, 8 to 10 p.m., metal plate work (technical).
Thursdays, 7.30 to 10 p.m., special science course.
Fridays, 8 to 10 p.m., metal plate work (practical).

THIRD YEAR'S COURSE.

Mondays, 7.30 to 10 p.m., machine construction and drawing (for iron workers and boiler makers).
Tuesdays, 8 to 10 p.m., metal plate work (technical).
Thursdays, 8 to 10 p.m., building construction and drawing (for zinc workers).
Fridays, 8 to 10 p.m., metal plate work (practical).

The instruction includes geometry and its applications to pattern cutting;

patterns for elbows, T pieces, round, oval, oblong and other articles of equal and unequal slant; tea bottle top, bath and hood patterns by long and short radius methods; cowls, ships' ventilators and patterns for boiler makers; seams riveted, grooved and soldered; solders and soldering, composition of useful alloys, tinning and galvanizing processes; the properties of iron, steel, tin, lead, copper and zinc; theory and practice of hollowing, raising and planishing metals.

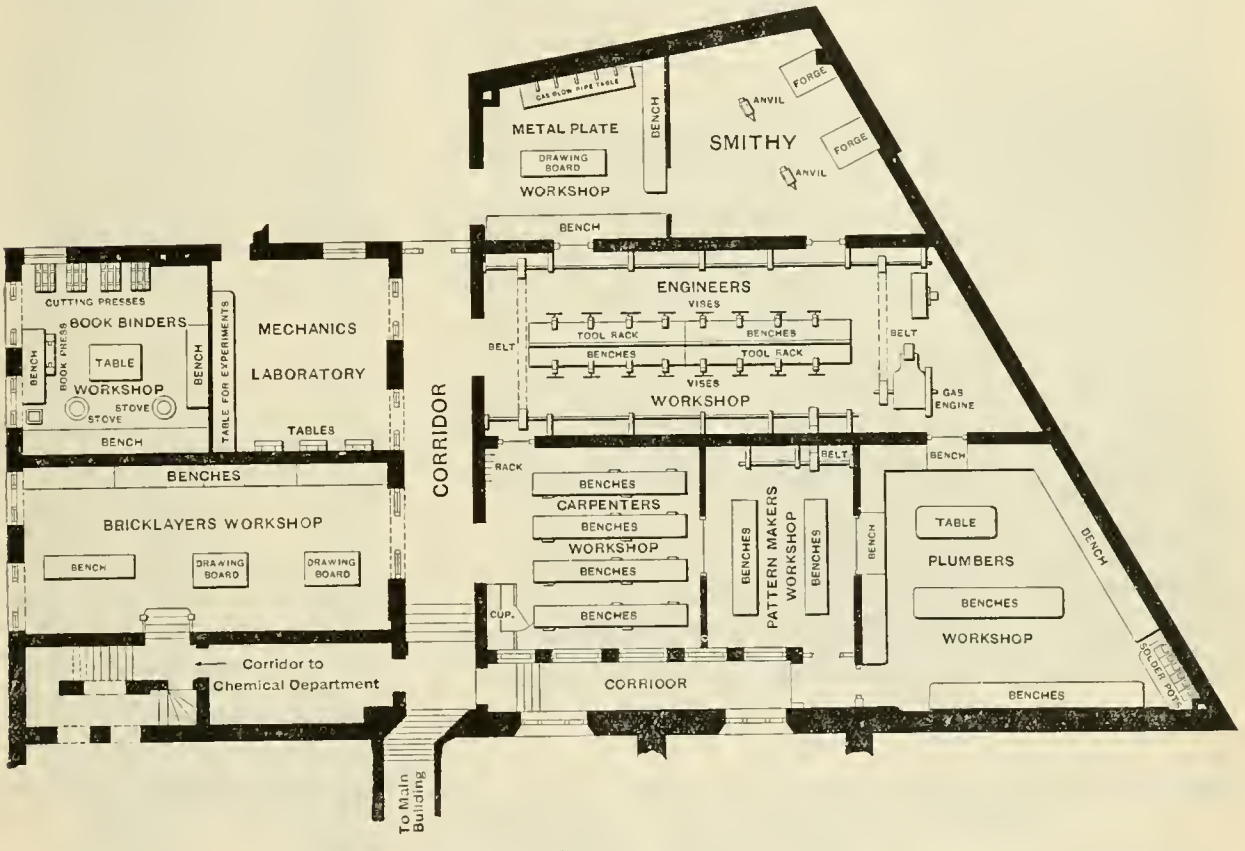
The new laboratory and workshop for metal workers is fitted up with all the necessary appliances for practically carrying out the above courses. During the session lectures on metals and other cognate topics are given by C. T. Millis, M. I. Mech. E., principal of the education department. It is to Mr. Millis we are indebted for the information here given.

Fees for Instruction.

As the benefits of the institute are intended to reach apprentices and workers in receipt of a small weekly wage, the class fees are fixed at an exceedingly low rate, ranging from $1 to $2 50 for each yearly course, so that the best instruction is placed within easy reach of all who are desirous of availing themselves of it. Moreover, students under 19 years of age are admitted at half these fees, and members of the trade classes may enter classes in other subjects at half fees.

Certificates and prizes are awarded by the institute to the students who are found proficient; examinations being held at the end of each session by representatives of the Science and Art Department of the city and guilds of London Institute and the Society of Arts.

The institute is under the direction of an able and experienced body of technical educators, and the trade classes are taught by master workmen of the respective crafts. The work already done by the students is said to be of a most creditable character. Specimens executed by the classes were on exhibition on the night of the recent opening, and were very favorably mentioned by the various London trade journals.



Borough Polytechnic Institute, London.—New Workshops.

New Publications.

ELEMENTARY METAL WORK. A Practical Manual for Amateurs and for Use in Schools. By Charles Godfrey Leland, late Director of Industrial Art Work in the Public Schools of Philadelphia. Macmillan & Co., New York, 1894. $1.50.

In this volume Mr. Leland has put into the hands of students of art metal work a manual which appears to be a very complete and helpful guide to the mastery of this fascinating craft, beginning with its first principles and carrying the instruction through to the highest stages. Although designed, as its subtitle indicates, mainly for use in schools and for the benefit of the amateur metal worker, the book goes very thoroughly into the art of decorative working in sheet metals, and contains much matter which would render it useful to practical metal workers. The book is devoted to an exposition of the processes of cold metal work, beginning at the rudiments and working steadily along into the most advanced forms of artistic and decorative work. It is divided into six portions, treating respectively of bent iron or strip work, flat sheet metal work, molded sheet metal work, *repoussé* or embossed metal work, ornamental silver work, and nail, scale and stencil work. The illustrations, 124 in number, are of excellent quality, and include engravings of all the tools and appliances used in the manipulation of cold metals, samples of elementary forms and curvatures, and a wealth of artistic patterns, with examples of the best ancient and modern metal work. Directions are given for making rings and curves of strip metal into objects; for soldering, shearing, chiseling, fret sawing and pressing sheet metal; for embossing sheet metal on wood and on pitch, and for every phase of cold metal working. The book contains 110 pages, is handsomely gotten up on thick paper, and bound in an artistic cover of black and bronze, making it a very attractive volume.

S. J. Seneca, Havre de Grace, Md., who in 1873 adopted as a trade-mark for his canned goods the words "Red Cross Brand," and the emblem of a red cross, which latter was registered as a trade-mark at the Patent Office in 1876, is naturally much disturbed over the bill prohibiting the use of the red cross as a trade-mark or designation. Mr. Seneca thinks that as the American Association of the Red Cross Society was not formed until 1881, his prior right in this matter should receive consideration from Congress. A trade-mark is at times a very valuable piece of property, and the interference by Congress with established rights in a matter like this would, we think, only be justified by a proper compensation.

The annual prize given by the French Society for the Encouragement of National Industry for the Utilization of Waste Products has been awarded this year to a Mons. Martinon for his process of recovering the tin from water in which silks have been treated with bichloride of tin for the purpose of imparting weight. By adding milk of lime to the water and by properly agitating it the tin settles down in a few hours, in the shape of oxide, and can be readily collected and utilized.

STEAM AND HOT WATER.

Estimating Surface Required.

From T. A. A., *Pennsylvania.*—Will *The Metal Worker* please answer the following questions on steam heating? Is it a good rule to multiply the length of a building by its breadth and the results by its hight, then strike off the two right hand figures and count the remainder as the number of square feet of surface required to heat it? Please publish a good rule for estimating the amount of radiating surface to be used for the space to be heated. What difference should be made in estimating for low pressure steam and for hot water in house heating? How many feet of 1-inch and 1¼ inch pipe should be used for 100 cubic feet of space?

Note.—It is probable that the secret of success in house heating is in correctly estimating the surface and properly piping it. No one rule is applicable to all kinds of buildings, whatever its basis may be, and of those in use none needs so much judgment in their application as the cubic foot rules. The rule given allows 1 square foot of surface for each 100 cubic feet of space, and for stores, halls and churches this might give satisfaction. For use in house heating it would in most cases prove unsatisfactory, as a wide variation is found necessary. Sometimes 1 square foot of surface is used for 70 cubic feet of space when the rooms are small and so located that but little heat is required; and often 1 square foot of surface is used for as little as 30 cubic feet of space when the rooms have a large glass surface and are much exposed. About 3 lineal feet of 1-inch pipe and 2⅜ feet of 1¼-inch pipe expose 1 square foot of surface, and in a room 15 x 15 x 10 feet, allowing 1 foot of surface to each 50 cubic feet of space, 45 square feet of surface would be necessary, requiring 135 lineal feet of 1-inch pipe, or 105 lineal feet of 1¼ inch pipe. This is equivalent to 6 feet of 1-inch pipe or 4⅜ feet of 1¼-inch pipe to 100 cubic feet of space. As our correspondent wishes to learn how to estimate surface, we would refer him to "The Metal Worker House Heating Essays," which give a number of different rules that have been used by different authorities for both steam and hot water.

Mixing Valves.

BY HELIOS.

Fig. 1 shows the manner of connecting a mixing valve for indirect radiation. In Fig. 2. On the outside of the hot air pipe place a crank and secure to the damper rod with a set screw, and from the end of this crank run a chain over pulleys up to the room with which the indirect radiation is connected. The chain can have a ring on the end and brass hooks to hold the chain.

A mixing valve connected to indirect radiation is used to regulate the temperature of the air entering the room from the indirect radiators. In Fig. 1 the mixing valve is closed, and all the air passing into the room that this radiator is connected to has to pass over the radiators in the box. If the room is too warm, by drawing up on the chain it will allow the cold air to enter the hot air pipe, which will lower the temperature of the air entering the room. If only cold air is wanted, draw the chain all the way up, and the damper will close the opening from the indirect radiators to the hot air pipe and open the cold air pipe wide open.

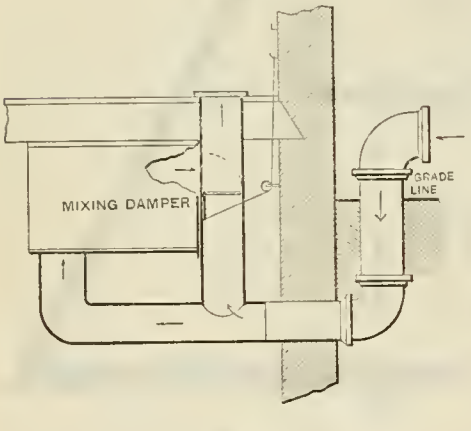


Fig. 1.—Mixing Valve Connected for Indirect Radiation.

Fig. 2.—Galvanized Iron Damper.

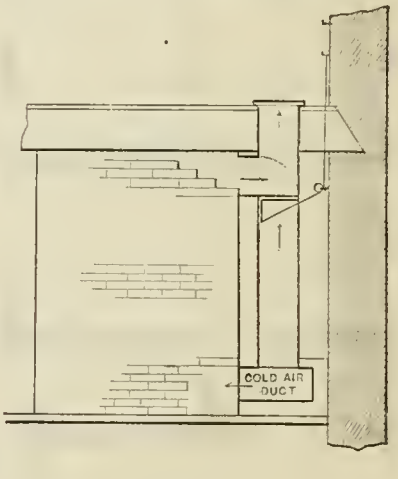


Fig. 3.—Brick Chamber for Indirect Radiation.

MIXING VALVES.

Fig. 3 shows indirect radiation built in with brick work, with cold air duct and mixing valve outside the brick walls. The brick work from the floor to the under side of the radiators should be 8 inch walls and above the supporting bars 4-inch walls. Cast iron doors and frames should be built into the brick work above and below the radiators. The mixing valve is connected the same as in Fig. 1.

In making the mixing valve connection take a branch the full size of the cold air pipe from the top of the cold air pipe as it enters the cellar. Start with a round pipe and form into a square pipe at the mixing valve. The opening from the indirect radiator must be full size of hot air pipe. Make a damper of galvanized iron and have it lap over on all sides of the opening from the indirect radiator ½ inch. Take a piece of round iron flat in the middle and bolt to one side of the damper as shown in Fig. 1. In Fig. 1 the arrangement and connections to the indirect radiators are the same as shown in a previous article. The cold air supply, as shown in Fig. 1, is taken from above the grade and carried down and through the wall of the building. An elbow is placed on the end to keep the rain from falling into the pipe. An iron ring made from ¼ x 1-inch iron is covered with wire screen and cemented into the elbow. The elbow on top and the pipe down and through the wall are vitrified sewer pipe. The pipe connecting to the indirect radiators is made of galvanized iron.

Heating Coils in Furnaces.

From C. O. F. Y., *Glendale, Ariz.*—I have just read the article on heating coils in furnaces in *The Metal Worker* of April 7, by an unknown correspondent, which sets forth some excellent ideas. It is the successful accomplishment of such work as described that makes the distinction between the expert and the novice, and the man who relates his experience as minutely as has been done in this case for the guidance of the craft receives their appreciation, although he very seldom hears of it.

Scollay Hot Water Thermometer.

The illustrations herewith show a new hot water thermometer being brought out by John A. Scollay, 74-76 Myrtle avenue, Brooklyn, N. Y. It consists of a nickel plated case with a dial and the expanding liquid, as shown in Fig. 1. A thermometer is shown in Fig. 2 which may be conveniently carried in the pocket, or is less conspicuous in use as is sometimes desirable.

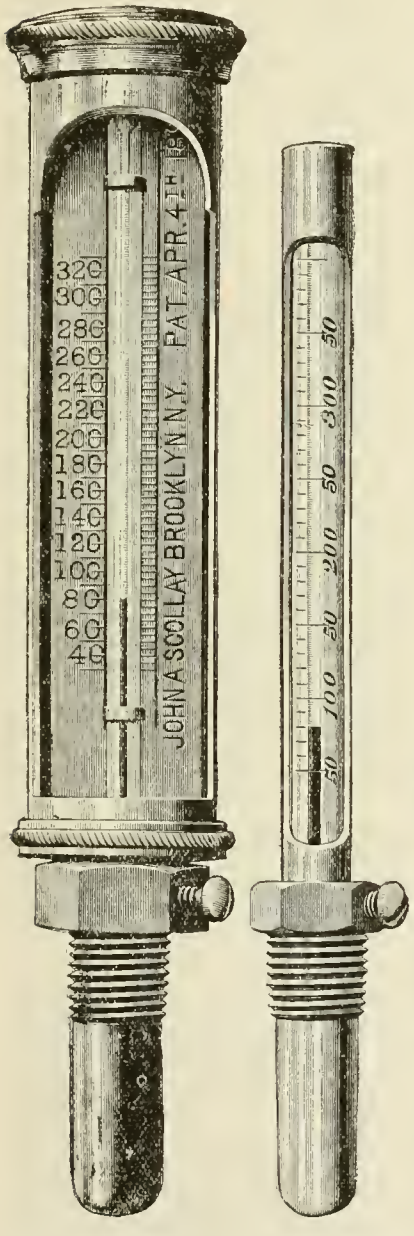


Fig. 1.—Thermometer for General Use.

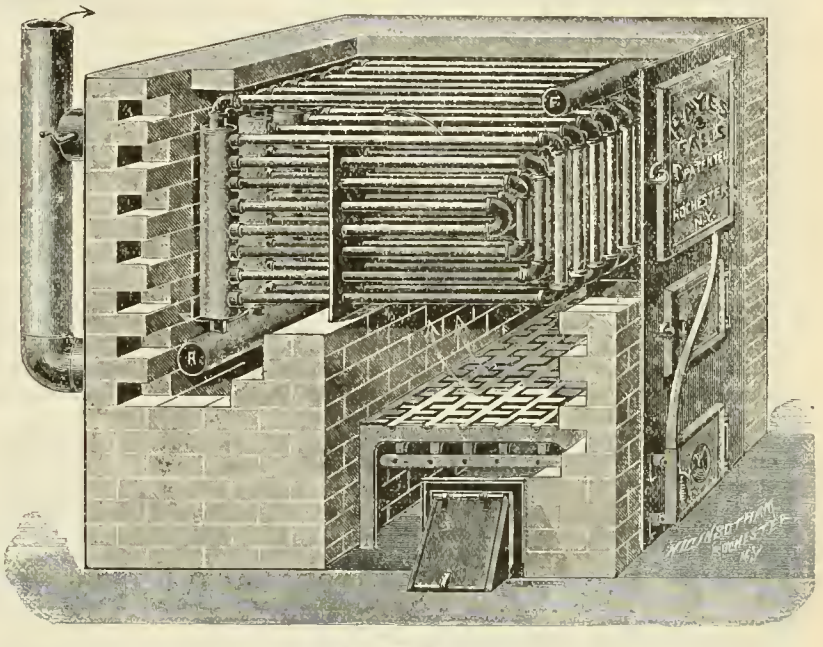
Fig. 2—Pocket Thermometer.

Scollay Hot Water Thermometer.

The features of the thermometer are size of threaded part, which is made to fit a ½-inch opening, and the fluid. A set screw at the side releases or fixes the thermometer in the threaded part, enabling that part to be readily set in the system. This part has a thin shell exposed to the water and is filled with mercury. The glass tube holding the expanding fluid is protected by a brass cylinder with a space around it. This portion extends down into the mercury. The fluid used is black and is adapted to registering temperatures as high as 500°. The black color, it is said, is permanent, so its hight on the white dial can be readily seen from the strong contrast.

The Torrent Steel Water Tube Boiler.

The accompanying illustration shows the Torrent steel water tube boiler with the brick casing partly removed. The boiler, which is intended for heating with steam or hot water circulation, is manufactured by Hayes & Falls, 290 State street, Rochester, N. Y. As shown in the illustration, it is intended for hot water, the same design, with trimmings, being adapted for steam. The boiler, it will be noticed, consists of a series of horizontal 1-inch tubes fastened into vertical cast iron headers 3 inches in diameter, the horizontal tubes being, furthermore, connected by short pipes or return bends at the outer ends. These vertical headers at the top are connected by 1¼ or 1½ inch tubes, according to the size of the boiler, with a 4-inch horizontal flow header, F. The lower ends of the vertical headers are connected with the return header R, a horizontal 4-inch pipe. It will be noticed that back of the furnace is a bridge wall, and above the bridge wall is a baffle plate to make the hot gases and products of combustion pass over all the tubes. It is said that circulation in the Torrent boiler is not interrupted by conflicting currents, the water through the lower pipes passing horizontally over the fire, then up and back through upper tubes to the vertical headers, from where it is carried into the main flow header F. There is an arrangement at the back for direct draft when starting the fire. The boilers are brick set and have large clean out doors at the back and front, so that the soot can easily be removed from the tubes. The manufacturers publish the result of a test, stating that the evaporative power of the boiler from steam at 213° to water at 212° was shown to be 11¼ pounds of water to 1 pound of coal. The boilers are made in nine sizes, with grate from 20 x 13 inches to 27 x 36 inches, with heating surface exposed to the fire from 48 to 193 square feet, adapted to carry from 413 to 1737 square feet of direct water radiation and 336 to 1451 square feet of direct steam radiation.



Torrent Steel Water Tube Boiler.

Papers by Master Fitters.

Some excellent articles have been prepared for presentation at the convention of the Master Steam and Hot Water Fitters' Association of the United States, which is to be held at the Broadway Central Hotel, New York City, June 19 and 21. The following are some of the papers, there being others promised, but of which the titles have not yet been made public:

"Warming and Ventilation," by David M. Nesbit, London, England.

"Difference in Radiating Surface Required to Warm Buildings of Poor and Good Construction," by E. P. Bates, Syracuse, N. Y.

"Types of Heating Boilers Used in the United States," by Arthur C. Walworth, Boston, Mass.

"System in Office and Drafting Room," by H. T. Crane, Cincinnati, Ohio.

"Early Reminiscences in Hot Water Heating," by John B Farnsworth, Leominster, Mass.

HEATING NOTES.

The New York office of the Huyett & Smith Mfg. Company has been removed to the Havemeyer Building, 26 Cortlandt street, where General Eastern Manager J. R. Wendover is prepared to talk heating and ventilating apparatus to all interested.

William H. Oakes, formerly manager of the New England branch of the American Boiler Company, Boston, has retired from that position and bought a partnership in the established firm of Buerkel & Co., steam contractors, 28 Union Park street, Boston. Mr. Oakes' successor in the American Boiler Company has not yet been appointed.

The New England Engineering Company, Boston, Mass., issue a circular printed in two colors relating to the Paul system for utilizing and circulating exhaust steam. The circular is prettily printed and the text is of an entertaining sort.

The Gorton & Lidgerwood Company, 96 Liberty street, New York City, manufacturers of the Gorton house heating boilers, will shortly issue a new edition of their book, "Modern House Heating," which bids fair to be in gen-

eral demand. The work typographically will be a work of art and will contain a fund of practical information as to the best manner in which to heat dwellings and other structures efficiently and economically.

JOHN SIMMONS COMPANY, 110 Centre street, New York, are making a large shipment of pipe and fittings to the Chino Valley Beet Sugar Company of California. The pipe, a large portion of which is 12 inches in diameter, and fittings fill several carloads. They are also cutting to specification the pipe for Cornelius Vanderbilt's residence, The Breakers, at Newport, R. I., and for John D. Clarke, 276 Water street, who is installing the heating plant. The fittings for this job are all specially made and some of these pipes are 18 inches in diameter.

D. R. MCJALLUM, formerly manager of the National Hot Water Heater Company and later of the American Boiler Company on the Pacific Coast, is coming to New York to assume the management of the branch office of the J. H. McLain Company, Canton, Ohio, makers of the Canton heater for hot water, steam or hot air.

THE NEWEST ATTRACTION shown by Albert Cryer & Co., heating engineers and contractors, at 85 Centre street, New York, is the No. 327 Richmond sectional boiler. This boiler occupies a space on the floor 5 x 8 feet and stands 7 feet 9 inches high to the top of the steam gauge. The sections are 3 feet wide and 5½ feet high. The boiler shown is the largest size, composed of 12 sections, and is rated to carry 2100 feet of steam radiation or 3300 feet of hot water radiation, and has fire chamber 27 x 57 inches. The boiler is arranged with direct draft or has a full diving return flue. The bottom water section of the boiler forms the bottom of the ash pit, and beneath this three flues are arranged as in a flat top cook stove. The indirect draft sends the smoke and gases to the back and then down to the bottom flue, where they pass to the front at both sides and return to the smoke outlet through a central flue. The boiler is set up complete, with the exception of the asbestos covering, and has a steam gauge and automatic draft regulator.

IRON, STEEL OR BRASS PIPE is bent into any shape desired by the Brooklyn Tube Bending Company, 48 and 50 Ross street, Brooklyn, N. Y., a specialty being made of galvanized coils. They have special patented machinery for the purpose and furnish coils for radiation. They make coils to be used for water heating in connection with furnaces where they are suspended over the fire and the water passes through them. They also make coils for heating water in tanks where the coils are immersed in the tanks and steam is passed through them.

C. F. GESSERT, 42 Dey street, New York, has just completed a renovation of his showroom, and is about to make a fine display of radiators, direct and indirect; flue, prime and extended surface for steam and hot water

THE SYSTEM of heating by steam and the method of installation used in the United States are attracting considerable attention abroad, and the American Boiler Company of 94 Centre street, New York, frequently prepare plans for buildings on the other side of the water. A feature of the plans which their engineer, W. A. Russell, makes is to have the flow pipes distinctly marked with red and the return pipes all marked in blue, making a very pretty effect.

A. S. LIGHT & Co. are a new business firm who will soon make their appearance at Saginaw, Mich. The company will do steam and hot water heating and plumbing and have rented the upper store of the D. H Jerome Building on Court street, which they will open about May 1.

THE CHICAGO ENGINEERING & SUPPLY COMPANY are to move from 108 Lake street to more commodious quarters at 167 and 169 on the same street. The company have the agency for and will carry a full stock of the Standard Radiator Company's goods.

THOMAS E. CRONE, manager of the American Boiler Company's New York office, has been in Chicago for a few days.

THE CHICAGO OFFICE of the Holland Radiator and Mfg. Company will be moved May 1 from 89 to 75 and 77 Lake street.

BLAKE & WILLIAMS, manufacturers of and contractors for steam and hot water heating and ventilating apparatus, will move to 186 and 188 South Fifth avenue, New York, about May 1. They have taken a large six-story building and will put in new pipe cutting machinery and increase capacity in their line of work.

CHARLES A. LATHROP, New England manager for A. A. Griffing Iron Company, reports himself now "at home" to all steam fitters at his Boston headquarters, 177-179 Fort Hill Square.

A GREAT DEAL is claimed by the Peerless steam house heater people for the simplicity, uniform heating power and cheapness of their apparatus. Their catalogues contain many excellent testimonials from people using the heater. George H. Bell & Co., 114 and 116 Nassau street, are sole agents for the United States.

THE LAST NUMBER of the German Valley *Quarterly*, German Valley, N. J., for April, 1894, contains an illustration and full description of the Florida heater, for which the F. D. Stephens Company are general agents for central and northern New Jersey.

FRANK W. SOMERS will soon move to his larger and more commodious quarters, 34 Dearborn street, Chicago, where he will have the entire store in which to show samples of the Bundy radiators and specialties. A. A. Griffing Iron Company were compelled to give up their place at 88 Lake street, as the half store there occupied was not large enough.

AMONG newly chartered corporations in New York State is the Queen City Radiator Company of Buffalo, of which the directors are W. F. Bryant, Orrin Bryant, Wm. H. Harrell of Buffalo and others. Capital, $300,000.

THE NEW YORK WARMING & VENTILATION COMPANY, with a capital of $50,000, have been incorporated at Albany, N. Y. The directors of the concern are W. F. Wolf of Boston, H. M. Caswell of Troy, N. Y., and Wm. H. Knowlson of Peekskill, N. Y.

ARTICLES have been filed with the Secretary of State for the incorporation of the Milwaukee Steam Heating & Electric Construction Company, at Milwaukee, Wis.; capital, $2500; incorporators, Henry Jane, George C. Kuntz and George Crooks.

SECRETARY GEORGE H. REYNOLDS of the Master Steam and Hot Water Fitters' Association moved yesterday to his new quarters, Rooms 324 and 325 Broadway Central Hotel, at 667-677 Broadway, near Bleecker street, New York. This will be his headquarters until the convention in June.

THE S. WILKS MFG. CO., 115 to 123 South Clinton st., Chicago, have issued a 28 page catalogue of the Wilks hot water heaters, steam generators, steel tanks, &c. The water heaters shown cover quite a variety, from small sizes for conservatories, baptisteries, poultry houses, carving tables, &c., to large ones for heating water for hotels, bath houses, apartment buildings, &c., and for heating dwellings, churches, stores and large buildings of all kinds. The large sizes are self feeders, being provided with a coal magazine. These water heaters are of a peculiar type, the fire being completely surrounded by water and the motion of the water being entirely vertical. Hot water tanks as manufactured by this company are either upright or horizontal. The Wilks steam generators, for heating dwellings, stores and large buildings, or for cooking feed, &c., are provided with coal magazines. Both the hot water heaters and steam generators are arranged with sad iron heaters around the base when desired. The catalogue thoroughly explains the construction of the company's heaters, gives full price-lists and also presents a large number of testimonials from those who have the heaters in use.

THE FOWLER RADIATOR & MFG. COMPANY is a new organization at 435 North Broad street, Philadelphia, Pa., who will continue the radiator business which was formerly conducted by H. Belfield & Co., who make a specialty of steam and water valves. The demand during the past season for their radiators has exceeded their facilities for production, and arrangements are being made for an enlargement of their plant such as will enable them to fill their orders promptly. They say that the Fowler radiators have already taken a place in the front rank, and the result of their last year's business has been very gratifying.

Thos. Fletcher of Warrington, England, writes to the *Gas World* as follows: "It is not generally known that the quality of ordinary writing ink depends on the gas supply. The best black inks are made from galls, and the use of vegetable (oak) galls has been superseded for many years by dried animal galls, which come almost exclusively from China. These are roasted in revolving cylinders, in charges of about 2 hundredweights, at a temperature of 300° F., and as the exact temperature is a matter of the utmost importance, gas is exclusively used for the purpose. The burners have an average consumption of 200 cubic feet per hour, and in an ordinary ink manufactory the work is considerable. As with mustard, the demand is created rather by what is dried up and wasted than by what is used. This is one of the apparently small industries which are in reality large; and help to swell the receipts of the gas companies for other and more regular purposes than lighting."

The employees of the Passaic Zinc Company's works in Jersey City, N. J., were informed last week that the 10 per cent. taken from their wages last December would be restored to them on May 1.

SCRAP.

THE PROJECT, to which reference was made in a late issue, of erecting a large tin plate works at Washington, Pa., has, we understand, taken definite shape. A company has been organized with a minimum capital of $250,000, all the plans have been prepared for a complete modern tin plate plant, and the ground for its erection has been secured. The town of Washington, Pa., has been fixed upon for its location, and citizens of that place have subscribed for a large number of shares in the enterprise. The actual commencement of building operations will depend largely upon the course of tariff legislation. N. E. Whitaker of the Whitaker Iron Company, Wheeling, W.Va., is at the head of the enterprise, and is said to be backed by some prominent members of the metal trade in New York City.

SAUNDERS, FIELDING & BOND, importers and dealers in tin plates and metals, have removed their office from 284 Pearl street to the Downing Building, 108 Fulton street, New York City. The firm are agents for the Pontymister Tin Plate Works of Newport, Wales. They have also offices at Swanses, Wales, and at Chicago, 419 Ashland Block, in which city they are the selling agents for the Morewood Tin Plate Company of Gas City, Ind.

REPORTS of projected tin plate plants are rife at the present time despite the uncertainty regarding the tariff. A late dispatch from Marion, Ind., announces that a large works, to cost $100,000 and to employ 300 men, is to be established at that place by E. Stanford.

AT MARSHALL BROS. & Co.'s mills, Philadelphia, the demand for black sheets for tinning purposes is crowding the establishment to the limits of its capacity.

ALL the Western tin plate works are reputed to be running to their fullest capacity on orders for American roofing plates. The main difficulty encountered in supplying the awakened demand is that of obtaining enough domestic black sheets. All the mills rolling this product are said to be behind their orders. Many have enough work on their books to keep their rolls in full work until the end of July. This is the case with the Eastern as well as the Western mills.

A WELSH tin plate manufacturer just arrived in New York City speaks of the present situation of the British tin plate trade in anything but cheerful terms. More than half the Welsh mills are idle, and prices are so low that profits have almost reached the vanishing point. Probably 5 cents per box is the outside gained by the average manufacturer, and even this modest profit is not easy to be obtained. Buyers' offers are as often as not below the actual cost of production.

THE United States Consul at Cardiff reports to the State Department a great reduction in the exports of British tin plates for the first quarter of this year, amounting to 22,500 tons, as compared with the corresponding period of 1893. During March this year the United States took only 16,997 tons of tin plates and sheets, while last year the amount for March was 31,334 tons. The exports were diminished to Argentine Republic, Brazil, France, Italy, Russia, Germany and Portugal, and increased to British North America, Australasia and several other countries.

THE MONTPELIER SHEET & TIN PLATE COMPANY of Montpelier, Ind., was incorporated on the 19th inst. with a capital stock of $200,000. The stockholders are Monroe Seiberling and Charles A. Ford of Kokomo, and Carl W. Kolbe, Daniel A. Walmer and David Moser of Montpelier.

Sizes of Furnace Pipes.

BY A. W. GLESSNER,

President of the Excelsior Steel Furnace Company, Chicago.

The time is near at hand when building will commence throughout the country and furnace dealers will begin their annual campaign. It may be opportune, therefore, to call the attention of the trade to the importance of careful figuring in regard to the sizes of furnace pipes, &c., to be used in the work in prospect. A great deal has been written and published on this subject by *The Metal Worker* during the past five years, and it would not be unreasonable to suppose that almost every furnace dealer has a fairly correct idea of the sizes of pipes and registers necessary for the efficient heating of rooms of a given size, but such does not seem to be the case. A short time ago the writer saw an estimate made by a Western furnace dealer for heating an elegant residence in his town, and that he was very anxious to obtain the contract for the heating of this building was shown by the detailed plans and specifications which he had gotten up and evidently submitted to the owner. On the second floor there were six chambers and a bathroom, varying in size from 4 feet 6 inches x 11 feet to 17 x 19 feet, and to heat these apartments the aforesaid furnace dealer had planned to use 4 x 10 stacks and 8 x 12 and 8 x 10 registers, irrespective of the varying sizes of the rooms. Comment on the result of such a job if put in according to these plans would be superfluous.

I append to this article a table which, while only approximate, may be found of considerable value to dealers who have not some such table evolved from their own experience. There is nothing particularly new in this table, but I do not remember having seen it in print in any of the trade journals. Any one using pipe according to this schedule in buildings within 100 miles of the forty-second parallel cannot go very far astray. It will be noticed, however, that comparatively few dealers or furnacemen use quite as large sizes of riser pipes as those referred to in the table, and possibly not a little of the trouble in heating chambers might be traced to the use of stacks too small in size. No table could be made to cover the ever varying conditions under which furnace pipe works, and I would therefore say that this table is based on normal conditions with runs of pipe of usual length and is intended to show the size of registers and pipes necessary to raise the temperature of air from zero outside to 70° on the inside within reasonable time without forcing. The sizes that are marked with an asterisk are those recommended for general use. The larger the register the less resistance to the flow of the heated air, but sizes mentioned will produce good results.

Size of register.	Equivalent in round or leader pipe.	Equivalent in square or riser pipe.	Cubic feet of space on first floor same will heat.	Cubic feet on second floor.	Cubic feet on third floor.
	Inch.				
6 x 8	6	4 x 8	400	450	500
*8 x 8	7	4 x 10	450	500	560
*8 x 10	8	4 x 10	500	850	880
*8 x 12	8	4 x 11	800	1,000	1,050
*9 x 12	9	4 x 12	1,050	1,250	1,320
*9 x 14	9	4 x 14	1,050	1,350	1,450
*10 x 12	10	4 x 14	1,500	1,650	1,800
*10 x 14	10	6 x 10	1,800	2,000	2,200
10 x 16	10	6 x 10	1,800	2,060	2,200
12 x 14	12	6 x 12	2,200	2,300	2,500
*12 x 15	12	6 x 12	2,250	2,300	2,500
*12 x 17	12	6 x 14	2,300	2,600	2,800
12 x 19	12	6 x 14	2,300	2,650	2,800
*14 x 18	14	6 x 16	2,800	3,000	3,200
*14 x 20	14	6 x 16	2,900	3,000	3,200
*14 x 22	14	8 x 16	3,000	3,200	3,400
*16 x 20	16	8 x 18	3,600	4,000	4,250
*16 x 24	16	8 x 18	3,700	4,000	4,250
*20 x 24	18	10 x 20	4,800	5,400	5,750
*20 x 26	20	10 x 24	6,000	7,000	7,450

The prolonged conflict in Brazil has at length been brought to a period. Official dispatches confirm the fact of the sinking of the insurgent battle ship "Aquidabsn" by a federal torpedo boat in the harbor of Santa Catharena on April 16. Admiral Mello has given up the struggle, and, with five ships, has surrendered to and obtained asylum from the Argentine Government at Buenos Ayres. The revolutionary movement is said to have completely collapsed.

Philadelphia business men complain bitterly of the disadvantages suffered by their city from the discrimination practiced by the railroads in the matter of freight rates. Concerted action will be taken by them, it is said, with a view of improving and enlarging the transportation and shipping interests of Philadelphia, which have suffered severely of late.

The delay in the construction of the new dry dock at the Brooklyn Navy Yard is attracting the dissatisfied attention of the Government. It is very probable that the present contract with Mr. Gillis may be revoked, and the Government may either carry on the work itself or allow another private firm to complete the dock, which is urgently needed for the ships of the new navy.

A shipment of 2800 tons of bituminous coal was made last week from Baltimore to Montreal, Canada, although a duty of 60 cents a ton and freight charges bring the price of the fuel considerably over that of the Nova Scotia product. Some of the Canadian manufacturers are, however, dissatisfied with the domestic coal, and it is for these parties that the present shipment, the first of its kind, has been made.

The depression in business and the accompanying restriction of imports is clearly illustrated by a statement of Custom House receipts since the beginning of the fiscal year, published in the *Journal of Commerce*. These receipts are shown to have fallen off $41,224,363, or nearly 40 per cent. as compared with those of the corresponding portion of the last fiscal year.

Press Working of Sheet Metals.—V.

BY OBERLIN SMITH.

Bending Processes.

Following a natural order, we come next to forming or bending processes, where the metal has its surfaces pushed out of their original planes into some new shape, but where the thickness is supposed to be not materially altered, except where it is incidentally made thinner in certain spots by being stretched, &c. In Fig. 177 is shown a V-shaped pair of bending dies and beneath them a straight plate of metal, *a*, together with the same as it appears after bending, at *b*. The dotted line *b'* shows where the dies tried to bend it and the black line *b* its final position as assumed by its own elasticity. This, of course, varies with the material, a piece of lead or even copper remaining very nearly in the same shape as the die which forms it, while iron, mild steel, hard brass, &c., in the order named, require such a die to be of a more and more acute angle, as the metal approaches nearer the character of a spring.

In Fig. 178 is shown a pair of bending or forming dies which are removed one step further from the simplicity of the first named, giving two bends to the work instead of one. Here the same difficulty occurs in regard to the edges springing part way toward their original shape after leaving the die, as shown again by the lines *b b*. It is not therefore possible with a die of this kind to produce edges which are exactly square with the main body of the plate. An approximation may, however, be sometimes made by bulging upward the horizontal surfaces of the dies, as shown by the dotted lines in Fig. 178, to an extent not greater than is suited to the elastic limit of the particular pieces of metal used. The die therefore attempts to make the work somewhat concave upon the bottom, as at *c*, which forms the corners at a sufficiently acute angle to approximately counterbalance the tendency to spring open; so that when the bottom has sprung back flat the edges will stand up perhaps nearly enough at right angles thereto. To place practical dependence upon this system, however, requires uniform blows by the press and uniform elasticity in the metal.

Forming Processes.

In Fig. 179 is shown a pair of round forming dies, where a flat circular blank, *a*, is laid in the recess *m*, which acts as a gauge merely for locating it centrally. It is then pushed by the upper die, or punch, U through the parallel opening *n*, and falls beneath the dies—being stripped off the punch when the same is ascending by the sharp stripping edge *o*. At *b* is shown the shape of the work when in a half way stage of the operation, its final condition being as at *c*. With dies of this kind the edge of the work cannot be very deep in proportion to its diameter, on account of the wrinkles which evidently attempt to form when the circumference is reduced. It is true that these incipient wrinkles can be somewhat smoothed out by allowing the punch and die to fit tightly enough to confine the metal to its original thickness—providing this thickness came uniform, which it usually does not in practice. In doing this, however, the metal of the edge is lengthened in certain spots in a vertical direction, which causes a jagged edge. If the depth is too much increased the wrinkles so fold upon one another as to tear the metal entirely away at certain places. The remedy for this will be considered later on under the head of the drawing process. With metal like ordinary tin plate, in diameters of not less than 2 inches, a width of edge from $\frac{1}{8}$ to $\frac{1}{4}$ inch can usually be obtained in plain forming dies without objectionable wrinkles.

With cylindrical work like that in question, and also with elliptical work (which resembles it by having a convex contour with an edge extending all around) the outward springing of this edge does not occur to an objectionable degree, as it does with rectangular work having two separate and unconnected edges, like that shown in Fig. 178. This is because the edge C forms itself into a hoop, as it were, to confine itself from moving outwardly, which it cannot do when released from the die without actually stretching in a circumferential direction; and this evidently can occur but in a very slight degree.

In Fig. 180 is shown a pair of forming dies for turning an edge upon an internal instead of an external circular contour. These take a perforated blank, *a*, and open out the hole, turning it downward into a cylindrical shaped edge, as at *b*. If an attempt is made to get this edge too wide certain cracks will appear, as at *c c*, &c., in the picture. As the edge in opening outwardly increases its circumference, it will not stand more than a certain amount of tensile strain, the stress here being of exactly an opposite character to the compressive one which forms the wrinkles in work like that in Fig. 179.

Embossing.

In Fig. 181 is shown one type of a pair of embossing dies, so called. The word "embossing" is used in this treatise, and very generally in the sheet metal trades, to denote a small degree of forming or bending at various points upon the surface of a piece of sheet metal, the location of which usually tends to show in top view a figure or design of some kind, decorative or otherwise, as for instance pictures, symbols, lettered inscriptions, &c. In such work the metal is pushed downward or upward more or less at various points into ridges and grooves, but not to a sufficient extent to tear it apart. The tendency is evidently to so tear it, as its outer edges are maintaining a rigid resistance against inward flow (except in certain forms of the drawing process) and the metal has therefore to elongate where forced to take a shape whose cross section shows a longer profile line. This is shown by the section of the piece of embossed work, *b*, which is longer in profile than is the blank from which it was made, *a*. In the case given I have represented a pair of circular dies with two annular grooves sunk in L, corresponding ridges projecting from U. This is a design sometimes used upon the heads of tin cans, &c., its object being partly to make them stiffer and perhaps partly for ornament. Such embossing, however, is merely typical of an infinite number of designs which may be thus stamped upon ductile metal. The word "embossing," as applied to this process, should not be confounded with the same term as sometimes used to designate the process known more properly as coining, to be described further on.

In Fig. 182 is shown a broken away vertical section of one groove and ridge of a pair of embossing dies, where the flat surfaces have approached each other within a distance messured by the thickness of the metal, represented by *m*. Theoretically the space between upper and lower die might properly be this thickness, *m*, at the points *n*, *o* and *p*, as the metal would then exactly fill between at all points. Practically, however, it is better to give an embossing die clearance at such points as *n* and *o*, letting the metal follow the "tight points" to suit itself, as in the picture. This is desirable, because some of the metal may be a little too thick, or dirt may accumulate in the dies, in either of which cases there would be a jam between the points *n* and *o*, which would prevent the dies coming down home, or, at any rate, would require a great deal more pressure to do the work. Another reason for this clearance is the practical difficulty of the die maker being perfectly sure that there is space enough everywhere, unless he follows the method here given, of being sure there is enough by having too much. It is customary to give a little clearance at *p* also, but this is not of so much importance, as a jam at that point would simply prevent the flat surfaces from coming together quite so close.

A simple method devised by the writer and long practiced by those working under his instructions for ascertaining the clearance of forming and embossing dies is to lay pieces of small lead wire, whose diameter may be about two times *m*, across the dies at the various points requiring a test. Between these points small pieces of the sheet metal to be used, whose thickness is *m*, are laid upon the lower die to act as blocking, so that the proper stopping point of the upper die may be insured. The press ram is then brought hard down, with the result of the lead being smashed out to the varying thicknesses represented by the spacing of the dies and as shown in Fig. 183. It is evident that all such points as *n* and *o* ought to be thicker than *m*, and this is generally easily determined by the eye. Such points as *p* must, of course, never be less than *m*, and may be a little more.

Embossing and Cutting.

Almost all the various processes of forming and embossing may be combined with cutting wherever the work is of suitable shape. The tools for conducting such operations are usually termed "combination dies," although the term is not very definite, being sometimes used, as before described, for the combining of two or more sets of cutting edges. In Fig. 184 is shown in vertical axial section a pair of combination dies such as are very extensively used for producing fruit can tops, as shown in section at *a*, and bottoms, as shown with embossed groove *a'* or plain at *a''*. In practice these dies are assembled in separate pieces to some extent to insure cheapness, durability and facility of repairs, but they are here depicted in conventional form. It will be seen that the outer cutting die has the female at the bottom as well as the inner one, a result which was not obtained in Fig. 166, Chapter IV., where the work remained flat. In this case the latter part of the upper die's descent cuts the central hole, while the forming of the edge at *b* and the embossing of the groove at *c* is taking place. It will be noticed that the turning upward of the inner wall of this groove causes a

Correction.—In the chapter of this article on page 40 of *The Metal Worker* of April 14, column one, twentieth line from the bottom, the letters "S" and "C" should be transposed, "S" properly being the sprue and "C" the casting.

tendency to crack, as in *b*, Fig. 180, although in practice it is not made deep enough to produce this effect. Such action does not take place in *a'*, because the stretching action is resisted by the continuous surface in the center, which is retained in the case of this can bottom by removing the central cutting punch *d* from the upper die. Should a plain flat bottom be desired, as at *a''*, the embossing punch *e* is also removed.

A knockout ring is shown in upper die at K and in lower die at K'. They are unnaturally given in closed position (as they would be were the dies shut together) merely to show better the general contour of the sectional view. Sometimes what is called an

scribed varies considerably, according to the character of the work and the condition of the dies. For given pieces of metal, however, it frequently happens to be a good deal more than for the cutting operations performed upon the same.

Assembling.

Analogous with forming processes proper, there are various cases where the assembling of two or more pieces is done, oftentimes upon the same general principle as the riveting down of an eyelet, or a rivet, which has been passed through two pieces of paper or metal. In general, some piece of metal which has previously been brought to shape by dies or otherwise

edges so shallow as not to form stiff trussea in themselves. The die maker is often blamed for work thus coming from the press twisted and sprung, so that it is impossible to make it lie flat upon a plane surface. Generally, however, a result of this kind is entirely owing to its design; and Dame Nature, rather than the die maker, must be blamed for one of the most provoking and perplexing problems which the die user is called upon to solve.

Mechanically the cause of this warping is due to the middle of the stamped sheet of metal being too small for the outside thereof, so to speak. This occurs when the central parts have been embossed or otherwise drawn together and put under a tensile strain, while

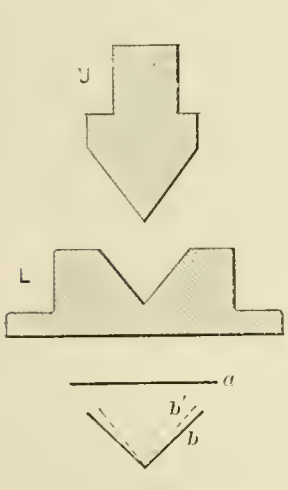


Fig. 177

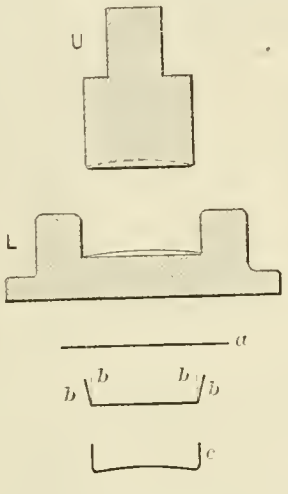


Fig. 178.

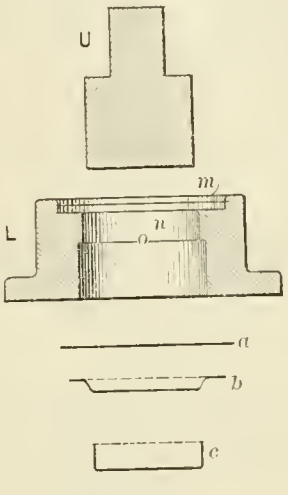


Fig. 179.

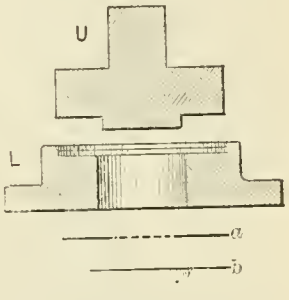


Fig. 180.

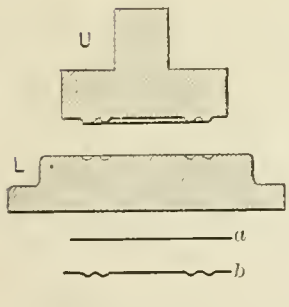


Fig. 181.

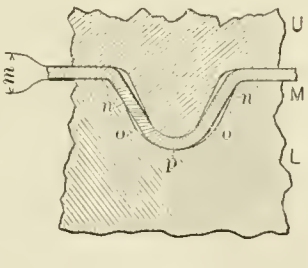


Fig. 182.

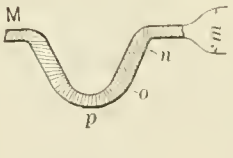


Fig. 183.

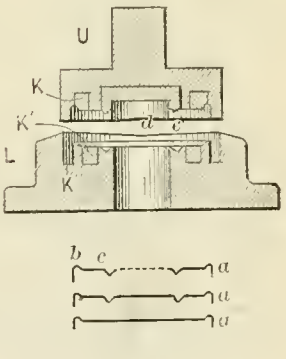


Fig. 184.

PRESS WORKING OF SHEET METALS.

"edge knockout" is used, instead of K', consisting of a thin ring rising in the groove K'' and pushing against the edge of the work, instead of underneath its flat surface. This ring K'', if driven up by strong springs, acts in some degree as a spring drawing attachment (to be described later on) and serves to smooth out the slight wrinkles which usually otherwise appear in the edge of the work. The knockouts described are generally driven by springs, but sometimes by pins extending through the dies and attached to or pushed by certain positive action knockout devices.

The speed at which forming and embossing work is done is of little consequence, as in practice the ram speeds of the presses in common use are none of them fast enough to tear the metal by moving it more rapidly than its molecular inertia will permit. The pressure required for the processes above de-

is driven tightly, or perhaps dropped loosely, into or on to some other piece or pieces, whereupon they are all fastened together by some auxiliary forming process which bends or forms certain edges or surfaces in a manner best adapted to locking the various pieces permanently together.

Involuntary Processes.

In addition to the humanly invented processes we have been considering, there are sometimes developed others, which, to a careless observer, might seem to emanate from the brain and hand of his Satanic Majesty. Among what may thus be called involuntary processes is the very annoying one known as warping, which occurs especially in the products of embossing and forming dies, as well as to some extent in drawn work also. The most favorable conditions for its occurrence are thin metals, large diameters, and

the average circumference of an outer zone, near the edges, has not been correspondingly reduced, and therefore does not assume the shortest distance around its course, which would naturally lie in a plane. A remedy is sometimes found by altering the design so that this outer zone may have various ribs and corrugations running approximately in a radial direction toward the center, such corrugations tending to take up the surplus metal in a circumferential direction. These additional features can often be added by a judicious designer in a way to serve a decorative purpose. A similar warped effect can obviously be produced by letting the middle of the metal alone and stretching or otherwise increasing too much the area of the edges. This, alas, is often done by forming dies when turning a narrow vertical edge around a large thin blank. Such action is due to imperfect "upsetting,"

where the circumference is reduced, and perhaps also to a too tight squeezing of the edge between the dies.

The converse of the conditions above mentioned occurs when the middle part of the sheet is too big for the outside, as is the case in any dished or saucer shaped work. This is often seen in bottom of buckets, &c, which have been somewhat bulged and which can be "flopped" back and forth, always staying in a position at either side of the plane of the outer zone of the metal accordingly as they are put. In such case the said outer zone is pushed outwardly by the central parts and is therefore in a taut condition, which tends to make it stay flat rather than otherwise. If that surpassingly skillful artisan known as the "saw maker" were to tackle a sheet of this kind, he would soon flatten it by hammering it near the edges. If, on the contrary, he hammered it in the middle, it would be because the conditions described in the last paragraph were present.

For the various forming and embossing processes described in this chapter, almost any type of press may or may not be suitable, according to circumstances. The type least likely to meet all conditions is, perhaps, a drop press, which usually has the peculiarity of a faster moving and more loosely fitting ram than have other presses. These machines, however, are especially adapted to some kinds of embossing work, and are sometimes used for forming, particularly in producing shallow pans, plates, trays, &c., in tin plate and sheet iron. In recent years they have been, for these latter functions, superseded to a considerable extent by drawing presses.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

Among recent contracts obtained by H. Sandmeyer & Co., Peoria, Ill., was one for ventilating the Streator (Ill.) school, a ten-room building that cost $35,000. Other contracts are for the Dickson dry closets in schools at Highland, Ill.; Effingham, Ill.; Tuscola, Ill.; Pana, Ill.; Lafayette, Ind., and Gilman, Ill. The ventilated flushing closet, which is also meeting with much favor, is contracted to be put into the Marshalltown (Iowa) High School and in the Streator (Ill.) school.

Coe & McMillen, Monticello, Ill., have secured a contract for heating and ventilating the school building at Monticello for $1872.72. They will use a 54-inch by 14 foot tubular boiler, made by the Kewanee Boiler Company of Kewanee, Ill., and Perfection radiators for the direct and Excelsior stacks for the indirect, it being a system of natural ventilation. The work will be done by C. W. DeForrest, formerly of E. K. Lockwood & Co. of Norwalk, Conn.

Carson & Co., Danville, Ill., have the contract for plumbing in the school building at Monticello, Ill., which will consist of a No. 2 Wolff range closet and urinal and a drinking fountain on each floor. The bid for the work was $561.

The J. H. McLain Company, Canton, Ohio, have secured an order through their San Francisco office for two Humber hot water heaters for the Whittier School, a State institution at Los Angeles, Cal.

T. B. Dewees, Phœnixville, Pa., has received the contract for roofing and plumbing for two new houses on Church street. He also has the contract for roofing two new houses at Spring City.

Plans are being prepared for the erection of an $8000 armory at Detroit, Mich., to be lighted by gas, heated by steam and to have a plumbing system.

F. J. Wood is to erect a store and office building at a cost of $20,000 at Grand Rapids, Wis., to be heated by hot water and have a plumbing system.

The School Board of Meredith, N. H., have appropriated $700 for a steam heating system for the school house.

John Simmons Company, 110 Centre street, New York, are furnishing to Edward P. Clarke, 126 Liberty street, New York, a hot water boiler and the heating pipes and radiators, to be exported to La Guayra, South America.

The Council of Providence, R. I., have appropriated $3500 for a heating system for the new central police station.

An improved heating system will be installed in the Winona Seminary, recently purchased by the Sisters of St. Francis of Winona, Minn.

The Davis Company of Moline, Ill., have been awarded a contract for plumbing the new High School Building, their bid being $1300.

Fay & Scott of Dexter, Maine, have the contract for installing a steam heating plant in Union Hall at Pittsfield, Maine.

J. Glandfield & Son of Dixon, Ill., have the contract for the erection of a school house to cost $19,000, at Oregon, Ill., which will have a system of heating and ventilating not included in their bid.

Wright Brothers of Ipswich, Mass., are installing a hot water heating plant in the residence of E. A. Wright, at Hamilton, Mass.

The board who have in charge the erection of a home for the feeble minded at Lapeer, Mich., have awarded the contract for heating to the Eureka Heating Company of Saginaw, Mich., for $7140, and the contract for the plumbing to William McFadden of Detroit for $2497. The contract for sewerage went to Perry & Hurley.

T. J. Tuomey, Seventy-second street and Third avenue, New York, is doing the plumbing work in the office building being erected by J. Lyons at Fourth street and Broadway. He is also remodeling the plumbing system in the old *Herald* building, at 194 Broadway, and is fitting up a storage warehouse for Sonn Bros. at 385 and 387 Washington street.

The Hub Plumbing, Heating & Stove Company, Clinton, Mass., are putting in a system of water works in the town of Boylston, Mass.

The contract for supplying the heating apparatus for the Young Men's Christian Association building at Springfield, Mass., was awarded to the Phillips Mfg. Company of that city, whose bid was $3300. They will use two No. 4½ Mills boilers of 37 horse-power each.

The J. F. Pease Furnace Company of Syracuse, N. Y., have recently secured through their agent at Harrisburg, Pa., E. E. Palmer, the contract for warming and ventilating the six-room annex to the Maclay Street School at that place.

Architect G. L. Harvey, Chicago, is making plans for an apartment building for Dwight S. Bryant, to be built on Forty-seventh street and Prairie avenue. The apartments will have all modern improvements, exposed plumbing and hot water heat.

The Baker & Smith Company, 193 to 197 Van Buren street, Chicago, are to install a tubular boiler and necessary radiation for steam heating in the new Post Office block, Fifty-fifth street and Monroe avenue.

The Union Iron Works & Steam Heating Company, Altoona, Iowa, have the contract for placing a Gurney double crown heater in the residence of T. D. Foster.

A low pressure system of steam heating will be placed in St. Mary's School, Burlington, Wis., by A. Zweibe & Son. One of the United States Heater Company's Hecla boilers will be used.

McGinnis, Smith & Co., Pittsburgh, Pa., recently installed the hot water heating plant in the Black & Bayard office building, at Pittsburgh, Pa. They used two No. 25 Gorton hot water boilers connected with one flow main and report satisfactory operation and a good circulation with a low temperature at the boiler.

Dugan Brothers, Salem, Ore., are installing a Royal hot water heater in the Oregon Soldiers' Home at Rosebury. The same firm have also the contract for doing the plumbing.

Bids will be received up to May 2 for the plumbing, gas fitting, steam heating and ventilating apparatus for the city and county hospital at St. Paul, Minn.

Architects Thomas & Rapp, Chicago, have received instructions from the Board of Education of South Evanston, Ill., to rebuild the school house recently destroyed by fire. The building is to be heated with steam and furnished with the latest improvements in ventilation. It will cost about $40,000.

Architects Beers, Clay & Dutton, Chicago, have designed for John R. Geary a four story apartment house to be built on the east side of Okenwald avenue, south of Forty-fourth street. The interior will be divided into eight apartments of seven rooms each and be heated by steam.

Architect Alfred Smith, Chicago, has prepared plans for a residence to be erected at 375 Ashland avenue. The front will be built of stone and the interior finished in hardwood and heated by hot water.

Architects Flanders & Zimmerman, Chicago, have prepared plans for a store and apartment house to be erected at the southwest corner of Fifty-fifth street and Monroe avenue, to be heated by steam.

Architects J. Sidney Villere & Co., Chicago, are preparing plans for a three-story apartment house to be built at the northwest corner of Deming and Hampton Courts, by J. Frank, to be heated by steam.

The Bridgeport Steam Heating Company, Bridgeport, Conn., have secured the contract for placing the hot water apparatus in the new mansion of Elwood Stokes Hand at Southport, Conn.

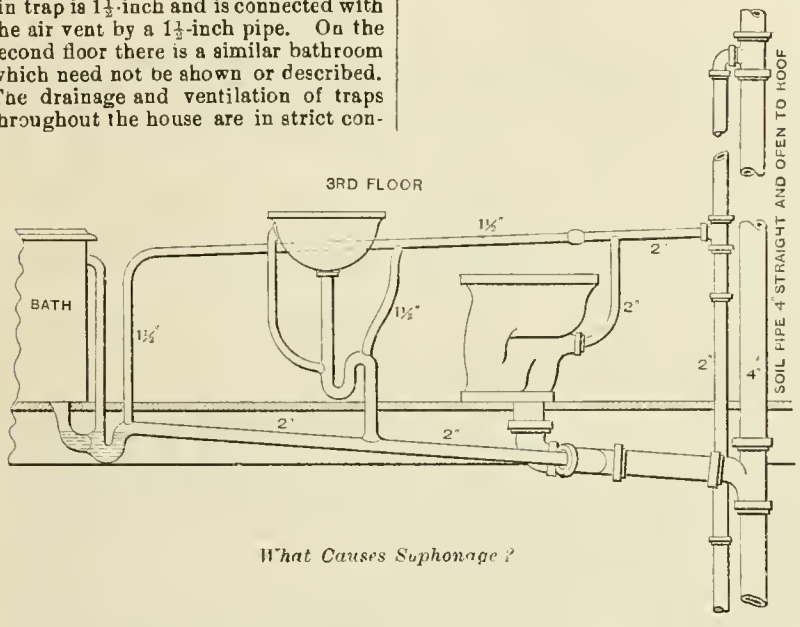
Architect DeWitt Taylor Kennard, Chicago, has designed for H. C. Brachvogel a three-story apartment house to be erected on Vincennes avenue, near Forty-eighth street, to be heated by steam.

The contract for the steam heating and plumbing in the Planters' House, at Pekin, Ill., which is to be transformed into a modern office building, was awarded McGreggor & Co. of Bloomington, for $800.

PLUMBING and GAS FITTING.

What Causes Syphonage?

From INQUIRER, *New York*.—Herewith is a sketch of the plumbing of a three-story house showing the pipes for drainage and ventilation. The water closet is of the ordinary washout kind, having a 2-inch air vent of lead pipe connected with a 2-inch iron pipe. The waste pipe of the bathtub is 2-inch and runs into a 4 x 2 Y that connects with the main soil pipe. The bath trap is 2-inch and has 1½ inch air vent. The basin trap is 1½-inch and is connected with the air vent by a 1½-inch pipe. On the second floor there is a similar bathroom which need not be shown or described. The drainage and ventilation of traps throughout the house are in strict conformity with the Board of Health rules. The job has been done in a workmanlike manner, no contractions of areas in any of the pipes or connections. All of the system is perfectly free from stoppage or solid joints or forgotten oakum. Will some of the thoughtful readers of *The Metal Worker* explain why the traps of the baths and basins are syphoned by the use of the water closet either from a prolonged flush or ordinary use?



What Causes Syphonage?

Plumbing Trade in Brooklyn.

Brooklyn plumbers generally report themselves as being fairly busy. The jobs in hand are, however, almost exclusively of small proportions. Householders are this season only having just such work done as they find to be absolutely necessary, and there is said to be a marked absence of the "cream" orders which usually develop in the early spring. The business depression of the past nine months seems to have touched all classes more or less, and this is reflected in the plumbers' order books as well as in those of the supply houses. In illustration of the situation, one of the most prominent plumbers of the city, who is accustomed at this season to handling contracts for work amounting individually to thousands of dollars, says that he looks on a $150 or $200 job at the present moment as quite a large one. Even these are comparatively scarce. In the spring he usually has orders for from eight to a dozen porcelain bathtubs, but this year there has not been a call for a single one. Collections, moreover, are not easy, and a good deal of even the smaller work is being taken on the installment plan of payment. The amount of building now in hand in Brooklyn is comparatively insignificant. Nevertheless, the hope that "springs eternal" prompts to the expectation of a development of better things in the summer, with a very good fall business, "provided the tariff bill is meanwhile passed or smashed," for there is plenty of work waiting for the time when money shall again flow in its accustomed channels.

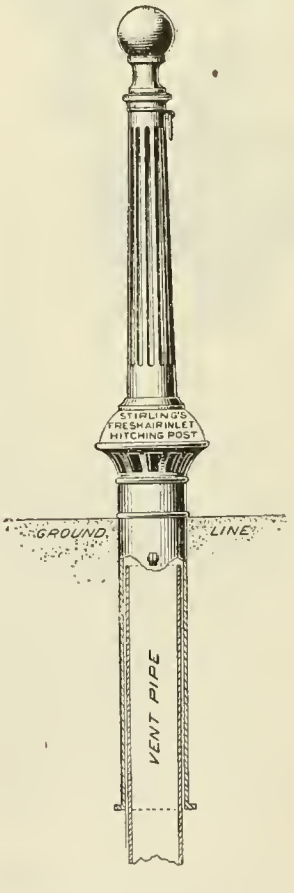
Newark, N. J., Plumbers.

The regular meeting of the Master Plumbers' Association of Newark, N. J., last Tuesday evening, found an attendance of 50 members and a very interesting meeting was the result. The committee who had waited upon the plumbers who had made an extraordinarily low bid to the city for plumbing and steam heating repairs for the coming year, reported that the bids had been withdrawn and the association expressed their gratification at the good work accomplished. Another feature of the evening was the appointment of a committee of five to make arrangements to celebrate the first anniversary of the association, which occurs on June 27. President Berla was very deliberate in selecting the members for this committee, and a number of pleasantries were exchanged during his deliberations. Treasurer Jacobi was selected for chairman.

ON A RECENT VISIT to the Department of Building of New York City it was discovered that in the plumbing and ventilating department the corps of engineers were more than two days behind in considering the plans that had been submitted to them for approval, and that these plans included a number of large and high class buildings. While this information comes from the Department of Plumbing and Ventilation, it shows that other lines of trade will be equally busy in the construction of the buildings and of the various appliances that will be needed in them. Until lately comparatively little was doing in this department, and Henri D. Dickinson looks on the rush of work at the present time as of more than ordinary importance in all lines of trade.

Fresh Air Inlet and Hitching Post.

The accompanying illustration shows a novel combination of fresh air inlet and hitching post made by Edward M. Stirling, 85 Market street, Newark, N. J. The construction and application of this device are so clearly indicated in the engraving that very little description is needed. It consists, as shown, of an ordinary hitching post, with perforations near the bottom connecting with the inner pipe that forms the lower end of the post, and fits over the top of the fresh air inlet from the house drain at the foot of the soil and waste pipe system on the house side of the trap. It is particularly mentioned by the manufacturer that this inlet is not liable to be clogged by dirt and become

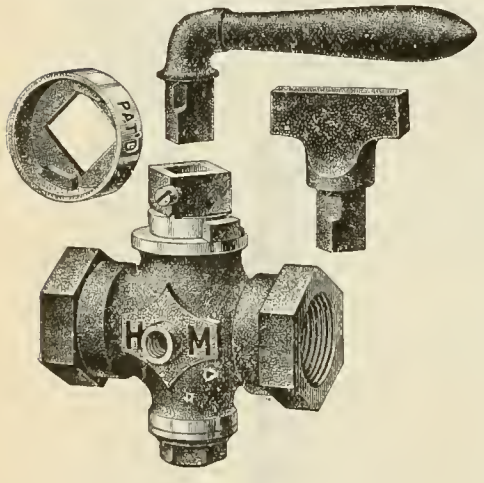


Fresh Air Inlet and Hitching Post.

useless, and does not present a conspicuous hole to be filled up by the mischievous small boy.

The Mueller Stop and Waste Cock.

The H. Mueller Mfg. Company of Decatur, Ill., have just put on the market a new stop and waste cock which has some special features which will be appreciated by plumbers. An illustration of the device is herewith given. It is so constructed that it can be changed instantly from right hand to left hand, or *vice versa*. The top is interchangeable, permitting the use of either lever handle, tee handle or square rod. The top of the cock is supplied with a cap that fits over the square of the plug, thereby preventing dirt or sand from working down alongside the plug and wearing out the cock. The cap is provided with two heavy lugs cast on the under side, and these coming in contact with a heavy lug cast on the body of the cock form a very strong and substantial check. These cocks are made only in straight way from ½ inch



The Mueller Stop and Waste Cock.

to 1 inch inclusive. They are designed for indoor work, but can be used for outdoor work equally well. The company state that these cocks are of a specially high grade of workmanship. The company also make a complete line of standard patterns of cocks for outdoor work, both in straight way and round way. All their brass goods are made of red brass metal and extra heavy pattern, and are tested to a pressure of 200 pounds. These goods are branded "H. M." A special claim for the cock herewith illustrated is that the plumber need not carry such a large stock, because he can use this make of cock for either right or left hand, lever handle, tee handle or square rod.

TRAPS AND VENTS.

The Brooklyn master plumbers will, it is expected, send a full and representative delegation to the forthcoming national convention at Detroit.

R. M. Wilson, Rome, N. Y., issues a catalogue of his well-known line of plumbers' supplies. In presenting the catalogue for 1894 the manufacturer calls special attention to his complete line of bathtubs. The Wilson patented aluminum and all copper sanitary bathtubs are especially alluded to. They are made from pure aluminum and Lake Superior copper, and have no enamel or paint. Other goods particularly noted are his folding copper lined bathtubs, copper range boilers, &c. The volume, which contains over 100 pages, begins with notices of bathtubs, followed by range boilers, copper balls, shower baths, bath and basin cocks, traps, lavatory brackets, miscellaneous fittings, ferrules, brass fittings, valves, pulls, flush tanks and closet seats. At the close is an alphabetical index.

Zalmon Goodsell of Bridgeport, Conn., one of Connecticut's representative plumbers, is being boomed by the local papers for Governor of the State. Those who have met him at the State and national conventions of master plumbers can testify of his fitness for the office.

J. E. Zimmerman, representing the Ideal Mfg. Company of Detroit, Mich., manufacturers of the Ideal sinks and tanks, recently shed the light of his presence upon the Boston trade.

The popularity of the smoke test for finding leaks in plumbing systems is shown by the number of plumbers who are securing apparatus for the purpose, among whom are L. D. Hosford, 43 Beekman street, E. A. Moody. 939 Sixth avenue, T. J. Daly. 1688 Broadway, and Ryan & Holmes, 280 Boulevard, New York, and George B. Lewis of Brooklyn. The machines used are of English manufacture and were purchased from the importers, the Myers-Sniffen Company, Limited, 46-48 Cliff street, New York.

W. P. Rose & Brother have opened a plumbing shop at 3620 Jacob street, Wheeling, W. Va.

The master plumbers of Holyoke, Mass., met at C. P. Lyman's office last Saturday night and talked over matters connected with the convention of the State association of master plumbers to be held in the city May 9. The meeting will be held at the Hamilton and will end with a supper at the hotel in the evening. About 75 members of the association are expected from out of town and all the local members will attend. The most important business will be the election of officers and there will be reports of committees appointed at the last meeting to secure legislation on certain points connected with the business. Discussion will be held on the plumbing ordinances adopted in several cities.

Fred. C. Barrett has moved his plumbing establishment to 24 Taylor avenue, Westfield, Mass.

The Board of Plumbing Examiners of Holyoke, Mass., are Dr. G. H. Smith, Peter Murray and Dennis O'Leary. They are now prepared to examine all who apply for licenses, and hope to have all applications in by May 1, after which date Inspector Murray will enforce the recently passed plumbing ordinances.

The R. T. Connell Plumbing & Heating Company have been incorporated, with a capital of $20,000, at St. Joseph, Mo. The incorporators are R. T., D. C. and Margaret Connell.

Wright Brothers are a new plumbing firm in the Jones Block, at Ipswich, Mass. They will carry a full line of steam and hot water heaters, stoves, furnaces and ranges.

Milton Schnaier of the plumbing firm of Boyd & Schnaier, 347 Columbus avenue, New York, has been appointed one of the advisory board of the Baron de Hirsch Trade School. He will recommend a new system of instruction for the plumbing class that presents some excellent features. The course will require six months, and a month will be devoted to each of as many different branches of the trade, accompanied by special lectures. By this means the pupils of the school will all have received the same instruction at the end of the term, and like regular journeymen will have an opportunity to discover for which branch of the trade they are best qualified.

Norwood & Bayle is the name of the new firm in the plumbing, hot water and steam heating business at Pittsfield, Maine.

W. A. Putnam has purchased the tin and plumbing business of John R. Todd at Warren, Mass.

Spring & Prasse, Keokuk, Iowa, have opened up a plumbing, steam and hot water heating, tin and sheet iron shop at 418 Main street.

D. B. Sullivan, plumber and tinsmith, has leased the store, 57 Little Water and 49 Shetucket streets, Lucas Block, Norwich, Conn. He will move into his new quarters about May 1.

Campbell & Dunn will succeed the late firm of Carey & Campbell, plumbers, at Erie, Pa., the dissolution of which was brought about by the death of Mr. Carey.

Celete D. Lindsey has opened a plumbing shop at 16 Moore street, Bristol, Va.

John Tucker is sending out an attractively arranged circular, printed in brown ink, bearing the addresses 130 and 132 Bellevue avenue, Newport, R. I., and 253 Fourth avenue, New York. It is a notice of his recently opened branch establishment at the former address. Plumbing, gas fitting and hot water heating are solicited, and it is stated that a specialty will be made of yacht plumbing and fitting up Turkish, Russian, shower and needle baths. A list is given of prominent citizens for whom he has done work, as well as of architects and builders.

T. J. Tuomey, Seventy-second street and Third avenue, New York, is using one of the smoke testing machines made by the Bailey-Farrell Mfg. Company for testing plumbing systems. The smoke test possesses several advantages and he is well satisfied with his experience with it.

One of the latest attractions in the show windows of the plumbing establishment of T. Sullivan, 34 East Twentieth street, New York, is a gas engine such as is used by him in raising water to tanks of high buildings in which he erects the plumbing fixtures.

Roberts & Simmons is the name of a new plumbing firm on La Salle street, Aurora, Ill.

Hammon & Leddy have opened a plumbing, gas fitting and tin shop in the rear of 230 Main street, New Britain, Conn.

The Myers-Sniffen Company, Limited, 46-48 Cliff street, New York, are sending out a four-page circular devoted to the recently patented improvements of the Em Ess Doherty self-closing faucets. These faucets have been on the market for the past 17 years and have proven their quality. The new feature is in the shape of the lever which opens and closes the faucet. They are

now made in such a form as to prevent them from slipping quickly from the hand and the resulting shock from destroying the valve seat. The cuts show the different faucets that are found in plumbing systems and the text states that they are furnished in polished brass, nickel plated and silver plated.

J. H. Donnelly will move his plumbing and stove business into a new store on Main street, Springfield, Mass., May 1.

The E. Stebbins Mfg. Company, Springfield, Mass., have added a fine line of plumbers' specialties to the exhibit in the Board of Trade rooms.

A bill before the Massachusetts Legislature decides the question of what constitutes a practical plumber, so far as applying to the inspectors of plumbing throughout the State. It requires the Plumbing Inspector to have worked five years at the business.

Plumber J. H. Donnelly, Ware, Mass., will move May 1 into a new store in the Hampshire Block that has been remodeled and arranged to suit him. He will display an entirely new stock of goods.

The Master Plumbers' Association of Rhode Island held its annual convention last Tuesday afternoon in Foresters' Hall, Newport, about 60 members being present. Ald. James Openshaw, president of both the Newport and the State associations, presided, and National President D. G. Finnerty, Vice-President Tierney of Providence and Vice-President Deady of Worcester, Mass., were present as guests. The visitors were shown about the city by the local members of the body, and were entertained at a banquet, Joseph Haire and P. J. Murphy acting as toastmasters.

The John Douglas Company, Cincinnati, manufacturers of the Douglas tank, plumbers' wood work and sanitary closets, have opened a Chicago office in the Ogden Building, 34 Clark street, Room 511, with Geo. L. Bottum as manager. Samples of all goods manufactured by the company will be placed on exhibition. The warehouse at 80 to 82 Pratt street will be retained, and in it will be carried a full stock of goods. Mr. Bottum will also retain his connection with the Lausten Lead Works.

P. J. Murphy, the plumber, has fitted up a most handsome sample room at his establishment on Spring and Mill streets, Newport. R. I. A Mexican onyx wash stand is among the samples.

A press dispatch from Milwaukee, Wis., dated the 24th inst., states that the master plumbers and their men have reached an agreement and the danger of a strike is over, notwithstanding that the scale of wages is to be greatly changed. The new scale will go into effect on May 1. Heretofore there has been a sort of sliding scale, running all the way from $1, paid to boys, to $3.50, paid to skilled men. Now the men are divided into two classes and two rates are made, $2 for inferior men and $3 for superior men. That is, those are the standard wages for the grade. No inferior men will receive more than $2 per day and no superior men less than $3.

New Orleans, La., is to have a new system of sewers, on which the work has just been commenced.

Chicago Plumbers' Strike Ended.

We are in receipt of a dispatch from Chicago to the effect that the plumbers' strike has been settled through the efforts of the Arbitration Committee of the Master Plumbers' Association and the Journeymen's Association. The two organizations have made mutual concessions, but the most important feature of the settlement is that the journeymen are to receive the old scale of wages—namely, $3.75 per day of eight hours.

The Ette & Henger Mfg. Company,

St. Louis, Mo., have just issued their catalogue No. 5, devoted to plumbing and water works. The catalogue contains 175 pages and includes everything which this firm make under the title head of the catalogue. Especial attention is drawn to the following lines, which are said to be entirely new to the trade: Their National service boxes are referred to as meeting with considerable success. In this style box the rods are placed inside the box, the combination key is adapted for opening the covers and also to fit on the end of stationary rod, the same key serving both purposes. Their line of gate valves is particularly complete, and it is claimed by the manufacturers that they are unsurpassed for quality of material, workmanship and principle. Each valve is tested to 300 pounds pressure. The National compression stable hydrant on page 31 combines a hitching post and drinking fountain, and is guaranteed anti freezing. The merits of their Non-wasting hydrant are especially referred to. They call particular attention to their line of hose pipes, as shown on page 68. There are no joints, no packing, &c., in these pipes to leak or wear out, and they will throw a full stream or any spray desired. The spray adjustment will permit of a spray as fine as mist, and will close off pressure entirely, acting as a cock. Their pneumatic water works is a newly perfected and simple system for supplying water by means of compressed air to houses, hotels, schools, public buildings, stock farms, &c. Their line of combination bathtubs occupies ten pages in the catalogue and are referred to as portable self heating, and in addition will give singly or in combination any of the following baths—hot water, cold water, hot air, steam, dry or wet vapor, dry or wet electric foot baths, alternating hot or cold showers, alternating hot or cold and plain, perfumed, or medicated spray, douche, syringe or bidet baths, and in addition have an adjustable stool with comfortable lazy back, which by a simple arrangement will automatically rub the back, with either brush, sponge, towel, or electrode. In addition to the lines of goods above enumerated they show many other plumbing and water works devices, which will be appreciated by the trade. The catalogue is being sent to the trade, and those interested are requested to send for a copy, which will prove a valuable addition to trade literature in this line.

The Cataract Electric Company of Buffalo, N. Y., have closed a contract with the Niagara Falls Power Company, whereby power will be supplied for use in Buffalo about October 1.

FLASHINGS.

The Globe Ventilator Company, Troy, N. Y., are distributing to the trade an illustrated catalogue and pricelist in the interest of their well-known Globe ventilators and chimney caps. The pamphlet is tastefully published and many illustrations show the cap itself and its application to buildings. These goods are made in brass, copper and galvanized iron and are recommended for the ventilation of schools, churches, hospitals, theaters, halls, mills, factories, cars, stables and farm buildings of every character. They are also referred to as a cure of smoky and sluggish chimneys and a corrector of downward drafts. They are likewise useful in removing sewer gas and are employed for rendering attics comfortable. A description of the ventilators is given and many testimonial letters are presented from those who have used them.

The Decatur Steel Roofing & Corrugating Company of Decatur, Ill., are distributing interesting pamphlets descriptive of their specialties. One of these is an illustrated treatise on "Laying Steel Roofing," by L. S. Bonbrake, and the other shows the style of goods manufactured by the company, such as rock face brick siding, sheet steel pressed brick, beaded iron, crimped roofing, corrugated iron, steel clapboards, metal corner boards, crimped edge roofing, eave troughs, conductor pipe, elbows, &c.

Casey & Galligan are a new firm in the tinning, roofing and plumbing business on Iron street, Bloomingburg, Pa. Mr. Galligan was formerly employed by John Bird and J. S. Thorn of Philadelphia.

Work is being rapidly pushed on the tin mills at the Ætna Standard plant, Bridgeport, Ohio. The machinery has commenced to arrive and it is expected that operations will be commenced in from 60 to 90 days. The first mills built will be experimental, and if the venture proves successful several more will follow. The old puddling department of the Standard plant has been entirely cleared and the building will be used as a tinning house. This arrangement concentrates the tin plate operations, as the tin mills are being erected where the Ætna plate mill formerly stood, directly opposite the Standard puddling department. Many other improvements are going on at this already extensive plant, and an increase in the capacity of the galvanizing shop is under consideration. During the past few weeks the Ætna-Standard mills have been operated more steadily than at any time since work was resumed last fall.

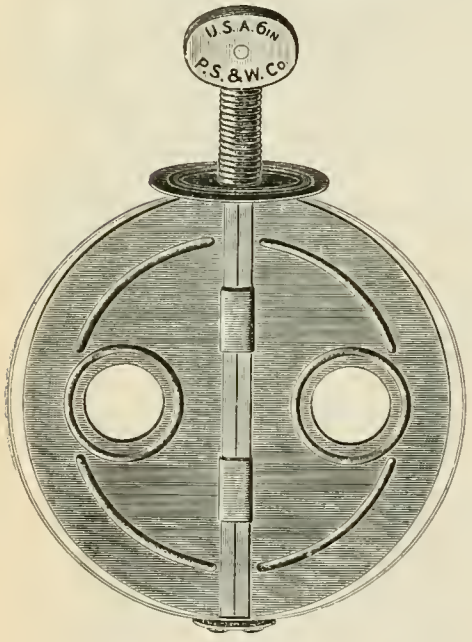
John Galt & Sons, dealers in slate, who for 21 years past have been located at 52 John street, moved to 253 Broadway, where they have fine new offices in Rooms 805 and 806 of the Postal Telegraph Building. This firm are well known in the slate trade, and are especially prominent in handling roofing slate of all kinds.

Baird, Thompson & Co. of Glasgow and London have recently fitted a new system of ventilation in several British steam vessels, which is said to be highly successful. Downcast and uptake shafts are fitted at either end of the hold to be ventilated, and ejectors, worked by compressed air, are fitted at the bottom of the uptake shafts. A constant circulation of air through the hold is thus secured.

THE RETAIL STORE.

U. S. A. Damper.

The Peck, Stow & Wilcox Company, 27 Chambers street, New York, are introducing the U. S. A. damper, as here shown. The disk is made of sheet steel with two 1 inch holes cut for escape of gas. The shaft is of wrought iron ¼ inch square bent double and pointed at the ends. On the side of the handle is a metal shield or disk to protect the double wood handle from heat. Between the handle and the shield is a tinned coil spring, put there to keep the damper rigid in any desired position. At the other end is a metal washer 1 inch in diameter, the pointed ends being spread or locked down with a chisel after the washer is in place. Holes ¼ inch in diameter are punched in the pipe on both sides. It is pointed out by the manufacturers that this damper is exceptionally light and that

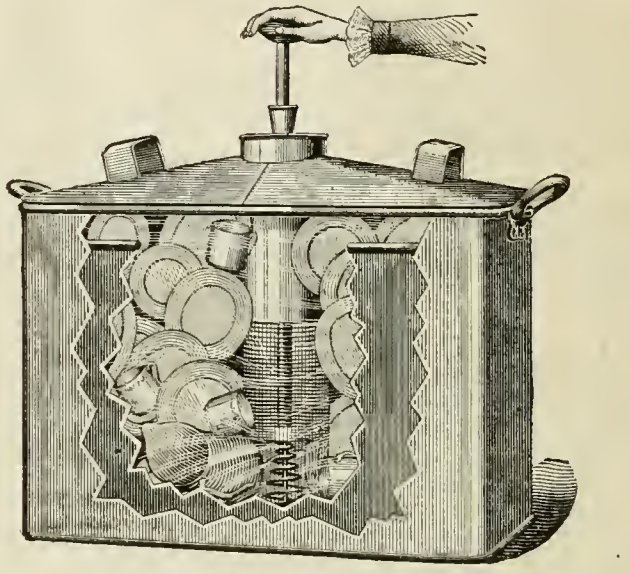


U. S. A. Sheet Metal Damper.

there is a proportionate saving in freight, and being of steel there is no loss from breakage, while the damper, if necessary, can with a pair of snip shears be cut to fit an oval, square or irregular size of pipe.

The Perfect Dish Washer.

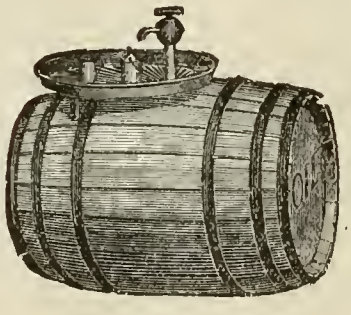
The illustration herewith shows the Perfect dish washer, which is just being put on the market by Geo. B. Cobb & Co., 96 Centre street, New York. It consists of an inner and an outer vessel with a cover. The outer vessel has a faucet at one end for emptying. The inner vessel has a perforated bottom and a perforated cylinder attached to it with a spring and a plunger within it. In operation the outer vessel is filled with boiling water into which soap or washing soda is dissolved. The dishes are packed in the outer vessel around the cylinder and then set in the water and the cover put on. The plunger is then moved up and down, forcing the water to rush over the surface of the dishes to dissolve and remove all grease, &c. When the dishes are washed the water is drawn off and a supply of clean hot water poured in to rinse them. The water is again drawn off and the inner vessel raised, and by means of handles with projections which catch on the top of the outer vessel the dishes are suspended to drain, and being hot they dry without the use of a towel and are said to have their natural polish. It is said that 50 dishes can be washed in five minutes without risk of breakage. The device is made of tin or galvanized iron in two sizes and is specially designed for household use.



The Perfect Dish Washer.

Barrel Pan for Oil Barrels.

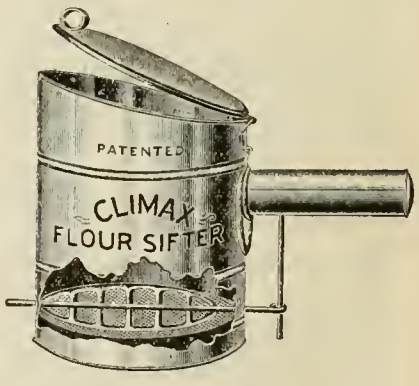
Sidney Shepard & Co. Buffalo, N. Y. are putting a barrel pan on the market, an illustration of it being given herewith. The apparatus consists of a pump, which is inserted in the barrel, and a pan surrounding it, the bottom of the pan being corrugated toward the pump aperture, thus draining all drippings of oil back into the barrel when used with illuminating or lubricating oils.



Barrel Pan for Oil Barrels.

The Climax Sifter.

We show in the accompanying cut a broken view of the Climax flour sifter, made by the Climax Mfg. Company, 415 Cuyahoga Building, Cleveland, Ohio. It is especially adapted to sift flour and is about 6½ inches high and 5 inches in diameter. The handle, it will be noticed, is so arranged that by a slight shaking motion the sifter is put into operation. It is worked entirely with one hand and by an easy motion.

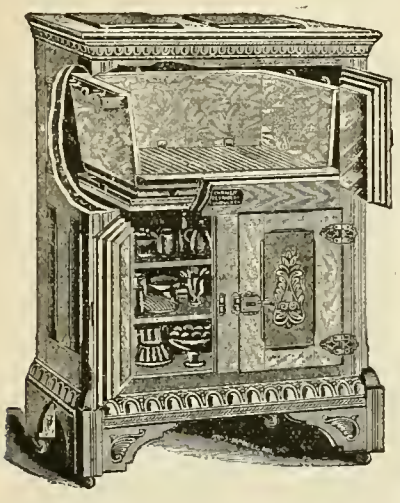


The Climax Sifter.

The Troy Nickel Works, Troy, N. Y., send out small cards illustrating and briefly describing the features of the Alaska tack hammer and of the Perfect ladies' tack hammer.

The Gurney Removable Ice Compartment.

The Gurney Refrigerator Company of Fond du Lac, Wis., have introduced a new feature in some of their refrigerators this season, in the form of a re-



The Gurney Removable Ice Compartment.

movable ice compartment, which is here with illustrated. It is used in that class of refrigerators in which the ice is put in through the front. It is supported by a heavy galvanized frame running around the back and two ends of the refrigerator, leaving ample air space for the air from the provision chamber to gain access to the ice. The compartment can be so readily removed for cleaning that the merits of this style of construction are obvious. The company have very recently been granted a patent on their application of this idea to a refrigerator.

Trilateral Pencils.

Joseph Dixon Crucible Company, 68 Reade street, New York, and Jersey City, N. J., have brought out a new form of lead pencil, as here illustrated, called the Trilateral. Its triangular shape prevents it from rolling off a desk, fits the fingers and does not tire the hand with constant use. It is handsomely finished, to resemble ebony, rosewood, satin wood and natural cedar, is full length and made in all grades from soft to hard. It is remarked that to those using a pencil continuously it will be found especially convenient.

Trilateral Lead Pencil.

Improved Coffee or Tea Urn.

Thomas Miller & Son, 106–108 Centre street, New York, are bringing out an improved Economy coffee or tea urn, as shown in Figs. 1 and 2. The main difference between this construction and the former is that the coffee or tea when made is kept hot and at a uniform temperature never reaching the boiling point, by means of a bath of hot air instead of hot water. Fig. 1 represents the urn complete, except the portable burner underneath. Fig. 2 is a sectional view of the apparatus. A is the cover, B the outer jacket, C a perforated metal spray pan for evenly distributing the boiled water, so that each portion of the pulverized tea or coffee is thoroughly saturated as the water passes through the mass. D is a cotton

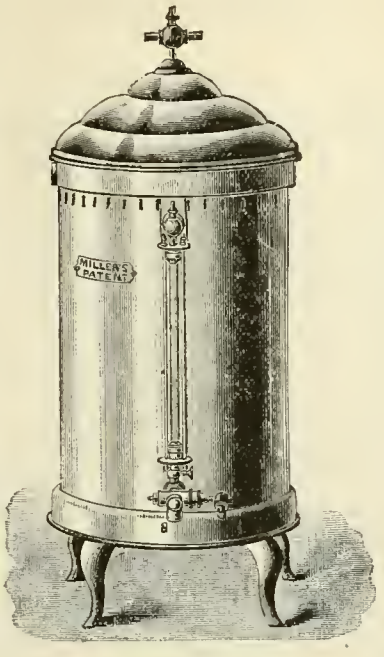


Fig. 1.—Economy Coffee or Tea Urn.

bag suspended from a wire rim, containing the tea or coffee. E is a stone crock receptacle for the tea or coffee, the enameling or glaze of which is guaranteed by the manufacturers not to craze. F is the hot air chamber between the jacket and crock, the supply of air entering at the bottom, and after being heated passes out through the perforations at the top, as seen in Fig.

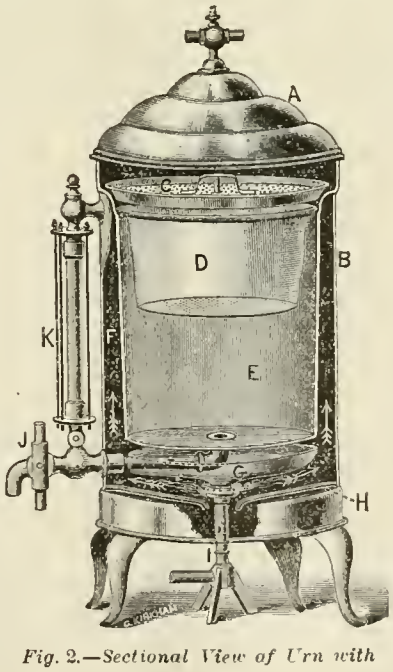


Fig. 2.—Sectional View of Urn with Burner Underneath.

1. By means of the cast iron diaphragm G, it is stated, the heat from the self-regulating gas burner I is radiated and evenly distributed, maintaining a constant bath or current of heated air against the crock E. The guard plate H is arranged to admit only a sufficient supply of air. I is an improved automatic self-regulating gas burner made for this service, although alcohol, oil, &c., can be used if gas is not available. J and K indicate the customary faucet and gauge glass. For a 4-gallon urn the manufacturers state the proper amount of heat costs but 2½ cents per day, with gas at $1.25 per thousand cubic feet. A glass eye piece at the bottom, 1⅛ inches in diameter, always affords a view of the burner. The urns are carried regularly in stock in capacities from 2 to 10 gallons, and larger sizes are made to order. They can also be furnished in sets of three with central water boiler and stone crock milk head with improved clean-out faucet.

MEMORANDA.

Yates & Co., Rockford, Ill., refer to their astringent lacquer as soluble, adhesive, tenacious and rust proof, and as proving a valuable acquisition to the stove dealer in making stove polish, rust proof varnish, rust proof roof paint, &c. The manufacturers state that upon application they will be pleased to mail to any dealer a pamphlet telling how to make a benzine paste stove polish at from 3 to 6 cents per pound that will prove a rust proof application and a durable jet black luster.

The Geuder & Paeschke Mfg. Company of Milwaukee, Wis., have issued a neat little pamphlet descriptive of the merits of their Cream City flour bin and sifter. The author of this publication has done his work in a most entertaining manner. Comparisons are made with the way in which "our mothers" used to get flour from a barrel, scraping against nails and spraining their backs burrowing in the barrel. The illustrations are effective, and in connection with the text show most happily the superior advantages of a flour bin and sifter over the ancient methods of handling flour in the kitchen.

C. Sidney Shepard & Co., 23 and 25 Randolph street, Chicago, have issued a spring circular of seasonable and other goods in their line as manufacturers of house furnishing goods in the sheet metal branch of trade. The circular covers 24 broad pages and gives illustrations and price-lists of water coolers, Lightning ice cream freezers, milk cans and can stock, creamery supplies, japanned bathtubs, cash boxes, dust pans, lamp stoves, family oil cans, tea and coffee pots, flue stoppers, flour sifters, egg poachers, mincing knives, conductor pipe, eave troughs, elbows of all patterns, sprinkling pots, gas stoves, tin plate, terne plate, mica, &c. The firm are manufacturers of a large line of deep and shallow stamped ware, pieced tinware and japanned goods.

March's failures in the United States were less than half, in number, compared with those of January last, while the proportion of capital involved was still smaller.

STOVE TRADE NOTES.

National Association of Stove Manufacturers.

In these columns last week we referred to the coming meeting of the National Association of Stove Manufacturers, and called attention to the plan which had been adopted with regard to papers to be presented at that time. As stated, the subjects to be covered were announced in our issue of March 31 in connection with the circular issued by Secretary Thomas. We now have pleasure in presenting below another announcement from the secretary's office, bearing date of April 21, and giving the names of the authors of some of the papers to be read before the National Association:

Allow me to remind you that the annual convention of the National Association of Stove Manufacturers will be held at the Auditorium Hotel, Chicago, on Wednesday, May 2, at 10 30 a.m., in accordance with my circular of March 24, also to repeat the cordial invitation to attend given by the president to all stove manufacturers, whether members or not. It is expected that papers of the greatest value and interest will be read and discussed. Among them will be an article on "A Theory of Ornamental Design as Applied to the Decoration of Stoves," kindly prepared by J. Leon Gobeille of Cleveland at the president's request; one on "Pattern Construction," prepared under the auspices of the Michigan Stove Company; one on "Foundry Management," by a gentleman now superintendent of one of our largest foundries, and whose competency is beyond question; two or more on "The Relations Between the Employer and the Employed," which will probably be written from different standpoints; one by Henry Cribben on "The Education of Apprentices and Maintenance of the Supply of Efficient Workmen;" one on "Cleaning Castings," by the good offices of the Abram Cox Stove Company; one on "Profit Sharing," by C. S. Prizer of Reading, whose paper last year met with such general commendation; one on "The Interchange of Information Among Stove Manufacturers," by the officers of the Fuller & Warren Company; one on "The Continental Stove Trade," by J. Goldschmidt, late United States Consul at Vienna, and others of general interest. It is hoped that there will be a full attendance of those gentlemen immediately connected with the productive department, as the meeting is expected to be of special interest to them, while there will be no neglect of topics connected with the distribution of goods.

W. H. Switzer, secretary and general manager of the Superior Furnace Company of Little Falls, N. Y., has recently returned from an extended business trip throughout the Western States, where he called upon the many patrons of the company, all of whom speak in glowing terms of the excellent results achieved in the past from the sales of this popular line of furnaces and heaters. We are advised that the prospects bid fair for a large increase of sales for the season of '94, judging from the many new agencies established by Mr. Switzer and the booking of some large orders for early shipment.

Electric Heating and Cooking Apparatus.

The likelihood that a vigorous effort will be made to utilize electricity for heating and cooking apparatus has induced the New York Board of Fire Underwriters to adopt the following special rules:

Electric Heaters, Ranges and Stoves.

a. These must be placed in safe situations (out of easy reach of inflammable materials) and separated from and supported on non-conducting and incombustible standards or bases so as to be at least 4 inches from wood work of any description or other inflammable material, unless protected by non-combustible materials, such as sheet metal and asbestos, or the like, so combined as to prevent appreciable transmission of heat, while securing full insulation. The heating wires or resistances of these heaters, &c., must be inclosed in non-combustible cases adapted to prevent accidental contact with exterior object or material.

These electric heaters, stoves, &c., must never be concealed, but must be at all times in plain sight.

b. They must have double pole switches, cut outs, &c, arranged as required for electric lights or power apparatus employing the same current and potential.

c. The attachments of feed wires to heaters, &c., must be in plain sight, easily accessible and protected from interference, accidental or otherwise.

d. Attachment of conductors to heaters, &c., must be securely made in the same manner that conductors are attached to motors or generators dealing with currents equal to those employed in these devices, and such conductors must be continuous from the heaters, &c., to the switch or cut out, which must not be within 2 feet of said heaters, &c. These conductors must be thoroughly well insulated and also covered with a good mechanical protection.

Portable Cooking Apparatus, Glue Pots, Curling Irons, &c.

a. The heating coils or resistances of these instruments must be inclosed in non-combustible cases, which in turn must be mounted on non-conducting and incombustible bases raising the same at least 1 inch from any surface on which they stand.

b. These instruments must not be attached to lamp sockets, and when current of more than 10 ampères is required they must conform to the same rules as heaters, ranges, &c.

c. Where currents of 10 ampères or less are required these instruments may be connected by specifically approved flexible double or twin wire conductors, provided such conductor is composed of two multistrand conductors, each of which is insulated by a water proof material and asbestos, while both are surrounded by a covering affording adequate mechanical protection. These flexible cords must also be connected to plug switches having double pole fuses in their sockets which will cut out the circuits if a cross connection should occur in the flexible conductor. Moreover, such plug switch must be so arranged that the plug will pull out and break the connection if an abnormal mechanical strain is brought on the flexible conductor.

The leading in wires of these flexible cords must be connected to heaters or the like at the point of lowest temperature, and where such wires are detachable at the heater, their terminals must be arranged with female ends protected by porcelain extending at least ⅛ inch beyond the metal terminals.

If the connection at the heater is fixed, a separable double pole connector must be placed in the circuit, so that in case an undue strain is brought on the conductors the device will be automatically cut out and disconnected.

Flexible cord connections longer than 6 feet will not be permitted.

Receptacles for plug attachments must be placed at least 6 inches above the floor.

Where switches are provided they must conform to the rules laid down in Section 26 of the General Requirements.

Where a number of utensils are grouped for general cooking service, installations to be approved must be provided with slate, soapstone or other approved slab or table for utensils to rest upon. Plug receptacles mounted on slate or other approved material shall be attached to mains running at least 6 inches above the working service of the table.

Sad irons and other heating appliances that are intended to be applied to inflammable articles, such as clothing, must be arranged as above as far as connections, &c., are concerned, and must also be provided with approved attachments which will cut off current when they are not in actual use.

The leading in wires to these forms of apparatus must be connected through porcelain connecting blocks, and the cable or cord of the same must be passed through an insulated elastic spiral or spring so arranged as to protect the same from kinking, chafing or like injury at or near the point of connection.

These conductors must be so placed that they will at all times be at least 4 feet from the floor and well protected against contact with water pipes or other possible ground connections.

The use of no flexible cord will be permitted, unless specifically approved by this board.

Gas for Fuel.

At the tenth annual meeting of the Ohio Gas Light Association, held at Columbus, Ohio, March 21–22, a paper by Donald McDonald on the subject of gas for fuel was presented. In his opening remarks the author enumerated some of the forces working from different directions tending toward the increased use of gas as a fuel, and also referred to a few of the forces which are retarding it. Among the latter he states that one is the attempt to use gas for purposes where its cost and other properties make its failure a foregone conclusion. "For cooking or for occasional fires," he says, "gas can be used with economy at $1 a thousand, but the man who attempts to heat a bedroom or an office with it at that price will certainly become disgusted with the whole business, and will very properly blame the gas company that induced him or allowed him to waste his money on such an experiment. With a good gas at 50 cents a thousand, all sorts of cooking can be done with it, and the heating of parlors and dining rooms, and those bedrooms which are not used as sitting rooms during the day, can be done at a cost so little greater than the cost of coal that people will put up with it on account of the greater convenience of gas. At 35 cents a thousand for a good gas containing, say, 700 heat units, gas can be used as a heating agent all over a residence, and the cost will not exceed

that of anthracite coal at $8 a ton or soft coal at $3.50 a ton, after allowance is made for kindling and labor. . . . If gas at 50 cents a thousand is burned in a good gas stove in a tolerably close room without any chimney draft, the products of combustion escaping into the room, the amount of gas required to heat the room will be so small that coal will not compete with it in price. The room, however, if it is small and close, will become unfit for habitation, owing to the consumption of the oxygen of the air and the formation of carbonic acid and watery vapor. . . .

"A room 16 x 16 x 12 contains about 3000 cubic feet, and will require 2177 heat units in order to bring its temperature up from 30° to 70°. If the combustion is perfect, and there was no other loss than that due to the actual products of combustion escaping at 300° F., such a room should be heated from 30° up to 70° with a consumption of 3 feet of gas per hour; or assuming that the air is changed three times per hour, and that there is no loss through the walls or windows, 9 feet of gas per hour would keep such a room warm.

"I was so much surprised at this low figure that I constructed a gas stove on this principle. It was of sheet iron, so made that no air could enter it except what was necessary for combustion, and this air was compelled to enter it at the very point where the flame originated. This I accomplished by using the ordinary burner composed of a piece of ¾-inch gas pipe, with holes ⅛ inch in diameter drilled 1 inch from centers and fitted on the end with an ordinary mixer and stop cock, so arranged as to take in air and gas mixed, and provided with valves so that the amount of air and the amount of gas taken in were capable of absolute adjustment. This burner was placed inside of a 2½-inch pipe of the same length, with holes ⅝ inch diameter, in such a way that the jets of mixed air and gas issuing from the small pipe were projected through holes in the larger pipe, and, of course, met a supply of perfectly pure fresh air, drawn in from the outside. The stove was connected to the chimney by means of a 4-inch flue pipe and there existed at all times a vacuum in the stove, so that whatever leaks accidentally existed in it served to take in air, but never to permit the escape of the products of combustion.

"I found that with this stove I could maintain the temperature of a room 16 x 16 feet with a 12-foot ceiling at 68° while the thermometer outside varied from 25° up to 35°, the consumption of gas being only 13 feet per hour; and the room being at all times sweet and wholesome.

"I drew some air out of the interior of this stove and analyzed it, and found that its composition was as follows: Carbonic acid, 6½ per cent.; oxygen, 7 per cent.; and the remainder was, I presume, nitrogen. Of course, such an atmosphere as this would be absolutely fatal to any kind of life in a little while. A lighted candle placed inside of the stove goes out in a few minutes, and even a stream of gas poured in against the flames refuses to light, for lack of oxygen with which to burn.

"Now, let us assume that instead of allowing these products of combustion to escape up the chimney, we allow them to escape into the room; the result would be that at the end of the hour the room would contain 13 feet of carbonic acid and a considerable quantity of watery vapor and would have its supply of oxygen depleted by about 26 feet. Thus we have in one hour lowered the oxygen to 19 per cent. and raised the proportion of carbonic acid from four parts in 10,000, at which it originally was, to 48 parts in 10,000, which is a great deal more than any of the authorities on ventilation allow and which does as a matter of fact render the room in question exceedingly oppressive.

"Of course the amount of gas required to heat the room by this last method is somewhat less, but the difference is evidently not worth the cost at which it is obtained.

"In pursuing this inquiry, I have examined the cuts of all the gas burning appliances which I could obtain; and in none of them do I find any attempt to separate the products of combustion from the surplus warm air before they reach the chimney. They all go on one or two theories; the first is to carry nothing up the chimney and allow everything to escape into the air of the room. This may be described as very cheap and very nasty. The other plan is to provide ample chimney draft, and let the householder pay the bill. This is healthy enough, but it is very expensive.

"I feel certain that gas will eventually take its place as the principal heating and cooking agent of the people. Before it can do so, however, the managers of gas companies must be prepared not only to make a good gas and sell it cheap, but also to instruct their patrons how to burn it so as to secure economy in the cost and a wholesome atmosphere in their houses. As long as the public have to choose between extravagant gas bills and close, oppressive rooms, the progress of gas for heating will be slow."

The Chicago Stove Trade.

If a report on the condition of the Chicago stove trade should be based entirely on what one or two manufacturers say, it would be very short. In reply to questions about trade they reply laconically, "There is none." Of course, they do not mean to be taken literally. They have not closed their foundries, called in all their traveling men, and made arrangements for going into liquidation. Their shipping departments are still fully manned and their order books pass no dates but Sunday. Their teams may haul occasional loads of flour or salt or miscellaneous merchandise, to earn an honest penny outside, but they have not entirely ceased to haul stoves. The expression referred to is simply used to emphasize the dullness prevailing. There is a stove trade in Chicago at the present time, but it is not up to what it should be. The influences which have dominated all kinds of business for the past twelve months are still in full force and effect, and the stove trade is obliged to suffer with every other branch of trade.

So far as the demand for stoves has existed its character has not differed radically from that of previous springs. Cook stoves and ranges have constituted the bulk of the business in staple goods. Advance orders have been taken for some heating stoves to be delivered in the early fall, but not to any great extent. The orders for cooking goods have been much smaller than in other years. Merchants will not anticipate their requirements, and regard the purchase of six stoves of six different patterns as a large order. In most cases, in fact, merchants are not ordering stoves until they are absolutely certain that they can sell them. This bareness of stocks, however, often brings about an accumulation of orders in the manufacturers' shipping departments which for a brief time restores at least a semblance of activity. The city trade this spring has been much smaller than that originating in rural districts. This is partly due to the hard times, which are felt most severely in cities, but is also ascribed to the large numbers of second hand cooking stoves thrown on the market shortly after the World's Fair by temporary sojourners in Chicago who had engaged in housekeeping during their stay. The number of these birds of passage was much larger than would have been supposed.

Some peculiar features of current trade may be especially noted. While a certain demand exists, and always will exist, for the highest priced stoves and ranges, yet the reduction of incomes and lowering of wages have caused a general turning to medium priced goods. This movement is recognized by manufacturers and is to some extent encouraged by them. Their medium priced goods are now of a much higher grade than ever before and they substantially offer a first class article for the lower rate. This is seen in steel ranges as well as in cast goods. The very best grades are held at high prices because manufacturers claim that they cannot be made to sell at any reduction, but they are offering very fine ranges, which they term medium priced goods, at much more reasonable rates, and find that these are reaching the people. Another feature of recent trade is that successful trips are reported by salesmen who have canvassed the very small towns which are usually neglected in ordinary times. Residents of such towns, being more closely identified with agricultural interests than in larger towns possessing manufacturing establishments, do not feel the depression in trade so seriously and are not economizing so rigorously. Notwithstanding the demagogic cry that farmers are in a chronic state of poverty, perpetually ground in the dust by the "money power," the farming communities of the West are found to be in much better shape than manufacturing communities. They may not enjoy all the sweets of prosperity occasionally tasted by manufacturers, but, on the other hand, they are not obliged, as now, to drain to the dregs the bitter cup of adversity.

The Kernan Furnace Company, formerly 59 Wabash avenue, Chicago, have moved their office to 71 and 73 West Washington street. The com-

pany will discontinue the retail branch of their trade, which will be in charge of W. J. McKay & Co., at the above location.

ODD PLATES.

The Prince Royal hot air furnace, made by Hart & Crouse, Utica, N. Y., is placed at the front of the New York showroom, at 211 Water street, by Manager W. M. Mackay. It is popular on account of being very low, giving a good pitch to hot air pipes, and having three No. 14 steel radiators it has a good heating capacity. Another feature is, the central dome being very large, excellent service is secured by the water heating coil when it is used as a combination heater.

W. Lapp & Co., 8 Peck slip, New York, make a specialty of sheet iron goods. They manufacture oyster ranges, broilers, pastry ovens, confectioners' and tinners' furnaces, as well as a line of coffee urns and broilers.

The Chicago & Erie Stove Company of Erie, Pa., have issued a circular showing the popularity with the trade of the Helper steel range, which they manufacture. The circular bears a letter from a customer in Parish, N. Y., in which he tells of the success in the way of sales resulting from a personal visit to the people in that section of the country and a demonstration of the merits of the stove named. The customer took the ranges in his wagon, and driving through the country showed the people how they would bake in the open air in the coldest weather and disposed of large numbers. By peddling out the stoves in this way the customer states that he has them favorably introduced and is certain of building up an extensive trade.

The Fuller-Warren Company of Milwaukee and Chicago favor us with copies of three pamphlets relating to warm air furnaces. One of the publications is devoted exclusively to wood burning furnaces made both horizontal and vertical, and another relates to the company's top return flue furnace adapted for hard or soft coal. This heater is made with cast radiator and is offered in portable form and also arranged for brick work. The third pamphlet relates to the same general line and presents in addition the details of construction. These goods are offered in a great variety of styles and sizes suitable for warming buildings of all kinds. The company have had more than 50 years' experience as heating and ventilating engineers, and are thoroughly familiar with the requirements of the public in this respect.

The Perry Stove Company of Albany, N. Y., have issued a convenient pamphlet telling of various kinds of oil and lamp stoves, among the number being two new constructions. One is the Royal F, an oil stove with four 4-inch burners, permanent extension top with four cooking holes and loose divisions, front and back. The body of the stove is of cast iron, nickel plated. The other new feature is a Royal lamp stove with two 4-inch burners, and is highly finished in nickel and japan. It also has the company's special burner, which is oil tight, and Russia iron chimneys with removable mica.

The Lehigh Stove & Mfg. Company of Lehighton, Pa., are favoring their friends in the trade with blotting pads of a size which renders them convenient for desk use. The paper is of yellowish tinge and carries printed matter in red. The inscription is to the effect that "Lehigh stoves and ranges are made only by the Lehigh Stove & Mfg. Company of Lehighton, Pa."

The Davis, Johnson Company have opened an agency for the sale of Schill's New Idea furnace at 45 East Jackson street, Chicago. The New Idea furnace is manufactured by Schill Brothers, at Crestline, Ohio, and is adapted to the use of hard and soft coal, coke, wood and gas. This furnace has been on the market but a short time, yet the manufacturers have already built up a large trade for it. They have added some improvements for 1894 which they are confident will win for it still greater favor.

The Thatcher Furnace Company have issued an announcement under date of April 23, to the effect that on account of increased business they will remove May 1 to 240 Water street. This location is central, and with the more commodious quarters which they will occupy gives the company much better facilities for exhibiting their line of goods and for carrying a larger stock than heretofore.

The Chicago & Erie Stove Company of Erie, Pa., send us a copy of a circular which they are about mailing to the trade relative to the Gas Helper range. The top surface of the range is provided with four burners having central draft and sawed on the side so they are not liable to fill up. It is also claimed for these burners that they are very economical, because they spread the flame into thin sheets, thus securing a large amount of heat in proportion to the quantity of fuel used. The two burners under the oven are easily lighted from the side by an ingenious device. The oven is made of light iron so that it will heat quickly and is mounted on a cast iron frame that fits to the front and can be drawn out as a drawer from a bureau, by lifting out two rivets at the bottom front.

The Baxter Stove Company of Mansfield, Ohio, have issued, under recent date, an announcement to the effect that, having just completed the adjustment of the losses sustained by the fire which visited their works on April 5, they are now prepared to close out their stock of Baxter's Banner stoves which were stored in the warehouse at the time of the fire, and which were somewhat damaged thereby. These stoves, we understand, were not subjected to the direct action of the fire, but were only damaged by water. They were promptly dried off and all nickel work replated, so that they can be cleaned and blackened with but little labor and retailed at prices fully as good as new stoves. With the circular letter the company are sending a list of the damaged goods which they will sell, subject to prompt reply, at specified discounts from list prices.

E. L. Tallmadge, formerly with Janes & Kirtland, has connected himself with the house of Eugene Munsell & Co., 218 Water street, New York, where he will act in the capacity of shipping clerk. He is well equipped for this service, as he is equally skillful in marking with either hand, which is a gift by no means common.

The Superior Furnace Company of Little Falls, N. Y., inform us that after May 1 all shipments of Superior furnaces, heaters and ranges to the Western trade will be made directly from their works, thus dispensing with the expense attending the carrying of a stock in Chicago for reshipment. In view of this fact all orders and communications should be directed to the company at Little Falls, N. Y., where they will be given prompt attention.

The Boynton Furnace Company, 195 and 197 Lake street, Chicago, have issued an important circular to the local trade, under date of April 20. In it they say that in addition to their large wholesale trade throughout the country they have been doing construction work in Chicago and suburbs for over eight years. During that time they have put in thousands of heaters and gained a high reputation. They continue: "We have decided to try a new departure—to discontinue construction work and, so far as possible, distribute this part of the business through the retail trade. We shall continue to advertise the goods as heretofore, and have a sufficient corps of competent salesmen who will canvass the city and suburbs, interesting parties so far as possible using our heaters and ranges, and we desire the co-operation of the local dealers who may feel interested in this new departure. If we can secure sufficient encouragement as manufacturers and wholesalers that the sales of our goods will not be lessened, this plan of operation will be permanent. It will cost us something to make this experiment, but we venture it with a hope that it will be a success for the retail trade as well as ourselves."

The Central Electrical Heating Company, 26 Cortlandt street, New York, are installing a complete electrical kitchen in the United States receiving ship "Vermont," at the Brooklyn Navy Yard.

Duparquet, Huot & Moneuse Company, 43-45 Wooster street, New York, manufacturers of French ranges and hotel and restaurant cooking apparatus and utensils, are engaged in fitting up the kitchen for the Hardware Club in the Postal Telegraph Building. They also fitted up the kitchens of the Metropolitan Club, at Sixtieth street and Fifth avenue, the Girard Hotel, Forty-fourth street and Broadway, and the Arkwright Club, at Broadway and Duane street. The culinary department of the Insurance Club, in the Mutual Reserve Building, was equipped by them.

The Smith & Anthony Company of 48-54 Union street, Boston, Mass., have taken the agency for the Splendid oil cook stoves, the special features of which consist of steel bodies and tops and brass burners and tanks. Outwardly these goods have much the appearance of gasoline stoves, which they are intended to replace. The burners are very powerful, one of them having a 15-inch wick. The Smith & Anthony Company control this line of stoves in the New England States and are in a position to promptly handle all orders with which they may be intrusted.

C. B. Baker, 52-54 High street, Cleveland, Ohio, recently issued an announcement to the effect that on April 5 the partnership heretofore existing between him and W. S. Myers was dissolved by mutual consent. The business will be continued at the place named by Mr. Baker.

The recently appointed postmaster of Corning, N. Y., is George W. Drake of the Corning Stove Company of that place. Mr. Drake is probably one of the youngest postmasters in the country, he having been born Novem-

ber 10, 1870, in the little town of Arnot, Pa. From a brief sketch of his life presented in one of the local papers, we learn that after spending his childhood days among the miners he moved with his parents to Corning. He was educated in the Corning Free Academy and in Holbrook's Military Academy, at Sing Sing, from which institution he graduated. Soon after he was engaged in his grandfather's bank, holding the position until three years ago, when he became identified with the Corning Stove Company. Mr. Drake's likeness appeared recently in the "Elmira *Telegram's* Picture Gallery of Prominent People."

Rathbone, Sard & Co exhibit on the sample floor of their Chicago house a specimen of their new steel Acorn range. This is a very handsomely finished but moderate priced steel range. It is furnished with high closet or high shelf, bracket reservoir or water front. The fire pot has double draft, both in front and at the side, so as to secure perfect combustion. It is fitted with a duplex grate, and the deep ash pan is made of planished steel. Special care has been taken in the trimmings. The edges of the high shelf are nickel plated and not merely polished. Nickeled pilasters of ornamental design cover the front corners, and a cornice extends along the bottom, which is usually left square and unrelieved. Very heavy nickel bands extend round the several doors. The high closet has a canopy top. In the high shelf there is a panel on each side of the pipe which forms a convenient tea pot shelf. These panels are hung on pivots near the bottom, so that the top swings over when needed for a shelf. The bottom is weighted, and the shelf swings up again when relieved of its burden. The oven door is so made that it can be held open ¼ inch so as to ventilate the oven or cool it off. The walls are lined with asbestos, which is covered with an iron grating so that it cannot be torn off. Six sizes are made, but the fire chamber fixtures are interchangeable in all, thus permitting a smaller stock of repairs to be carried, which is a feature that will be appreciated by dealers. This range is made with 18, 20 and 22 inch ovens and with four and six cooking holes. The line is thus complete in every respect.

The Peninsular Stove Company are bringing out a new heater, to be known as the Air Tight Peninsular. It is an incased stove with interior construction after the style of an oak stove. The exterior work will be very ornamental, so that the stove will be fitted for use in richly furnished rooms. It will be made in three sizes to suit all requirements.

Edmond Raftery, assistant manager of the Chicago branch of Rathbone, Sard & Co., sails for England on May 5, for a two months' visit to relatives.

The Peninsular Stove Company of Detroit, Mich., have just completed and placed upon the market a new soft coal heater which is known as the Air Tight Peninsular. It is offered in three sizes, at a low price, and is ornamented in an effective style. The outer cast section is open fretwork, connected with openings in the extreme bottom, thus allowing for a free circulation of air and forming a complete double heater. The stove, as its name implies, is air tight, having few joints and these carefully fitted. The inner body is made of No. 12 cold rolled wrought steel, thus insuring, it is claimed, quick and powerful radiation, and at the top of the body of the heater is a heavy globe dome so arranged as to conduce to perfect combustion.

The Union Stove Lining Company of Weir Village, Mass., recently closed their plant owing to business depression, but it is intimated that the works will resume as soon as the situation improves. The company have been working full time right along, and when they resume operations they hope to be able to continue with a full force.

A. T. Matthews, general manager of the Matthews Mfg. Company, Worcester, Mass., makers of steam pipe collars, ferrules, stove trimmings and seamless sheet metal specialties, has returned to Worcester after a very enjoyable Western trip, during which business and pleasure were combined in about equal parts.

The Enterprise Stove Works, at Vincennes, Ind., shut down for a few days, a week or two since, in order to make some necessary repairs.

The Carmichael-Wilks Range Company of Chicago have recently been incorporated, with a capital stock of $50,000. The incorporators include D. L. Carmichael, W. B. McCloud and Perry Russell.

The Indianapolis Stove Company of Indianapolis, Ind., are now running full time with a force of 100 men. President Bennett states that there is no rush of orders, but enough are received from time to time to keep the works running with the force named.

The Carton Furnace Company of Utica, N. Y., have brought out a new heater known as the Carton hot blast smoke burning furnace, with vertical combustion flues. It is made of cast iron without the use of bolts and is claimed to operate without soot, dust or gas. The manufacturers state that the furnace has been thoroughly tested and every heater is guaranteed.

The Bellaire Stove Works of Bellaire, Ohio, which have been closed for several months, resumed operations last week with a force of about 200 men. We understand that the company have a fair amount of business on their order books and expect to run regularly until July 1.

The Fuller & Warren Company of Troy, N. Y., have nearly ready for mailing to their friends in the trade circulars of two new ranges. One of these is a double oven range made in portable form and also adapted for brick work, while the other is a single oven range bearing the name Stewart. The latter has a large square oven and is also provided with the company's patent oval fire box with their triple interchangeable grates — namely, the Dockash, triangular and draw center. In fact, the manufacturers state that all their ranges are now made with these three grates. We also understand that the company have just completed a basket grate for wood which can be used in any of their fire boxes.

Schill Brothers of Crestline, Ohio, have brought out a pamphlet for 1894 containing a long list of testimonial letters from some of those who have used their furnaces. The last page of the pamphlet illustrates and describes a recent addition to their assortment which is being offered under the name of the Schill furnace. This is said to contain all the fuel saving and heat producing qualities that have made the New Idea so well known, and has patent center draft, diving flue, double fire pot, shaking and drop center grate, asbestos packed joints, cast front and heavy castings. The dimensions are the same as the New Idea except the drum, which is 26, 30, 36 and 40 inches in diameter in the various sizes.

The Art Stove Company of Detroit, Mich., favor us with copies of two catalogues neatly bound in colored paper covers which they have issued to the trade. One relates to the Laurel steel range, which is made with the modern features and is offered in a great variety of styles and sizes. This range, we understand, has proven very popular, and can be furnished with a water front or hot water reservoir, as may be preferred. The second pamphlet illustrates and describes the Laurel oil heaters, which embrace sheet iron drum constructions as well as lamp stoves. Among the assortment is a combination heater arranged with a top cooking surface, provided with two boiler holes. The construction is termed a parlor cook stove, and being mounted on rollers can be easily moved from room to room. The manufacturers say that these goods are meeting with gratifying success, and that among other places they have been used by the pupils of the Chicago Cooking School. A few pages are devoted to the Laurel ovens, drums for the Art Laurel stove, cooking tops and Laurel wicks.

The Quick Meal Stove Company, St. Louis, report an excellent trade for the Quick Meal gas and gasoline stoves. A recent letter from a customer in Louisville, Ky., contained the following: "Notwithstanding the hard times we are meeting with splendid success with the Quick Meal stoves, and think we will sell as many, if not more than we did last year." Their traveling men are sending in encouraging reports, and all things considered, they are well satisfied with the outlook.

OBITUARY.

ALFRED HOPKINS.

Alfred Hopkins of Bridgeport, Conn., well known to the plumbers of his own State and to those who have visited the different National conventions, died at his home very suddenly last Wednesday afternoon from rheumatism of the heart. For more than 40 years he has been engaged in the plumbing and stove business on Water street, Bridgeport. He was 62 years of age, and is survived by a widow, a son, William P., and a daughter, Mrs. L. E. Sage.

W. H. Hill's stove and tinware store, at Marlboro', Mass., was badly damaged by a fire which visited the Burke Block in that city on April 26.

There is a probability that the pottery troubles which have agitated Trenton, N. J., for so long may be settled by an agreement between the manufacturers and the men before the end of the present week. About 4000 operatives have been locked out in that center of the pottery trade since last January.

The umbrella trust is reported to be in a state of disintegration. The combination was formed about two years ago with a nominal capital of $8,000,000, and included most of the leading manufacturers. It is not, however, proving remunerative, and has not served to quell competition.

TRADE REPORT.

The Iron Market.

The market shows an improving tendency, and while prices are about the same it is easier to do business than it has been for a long time past. Consumers' requirements are widening, and in many cases deliveries are called for with the utmost urgency, showing that stocks are low, and that whatever demand there is must be supplied from new purchases. The amount of business done during the past two weeks is larger than for any similar period since last summer, and while there may be somewhat of a pause during the remainder of the month, there is good reason for believing that the improvement is genuine and likely to be maintained for some time to come.

The labor troubles are the principal element of uncertainty in the situation at the present writing. The general strike of the Bituminous Coal miners and that of a portion of the Connellsville Coke workers may, if lengthened out, seriously affect some of the mills and furnaces.

The strike in Alabama would influence quite different interests if established and continued. It would touch the founders throughout the country. As yet all the furnaces in the Birmingham district are running and the chances seem to be against the men, many of whom recognize that since there has been no change in wages in the last five years, in spite of the enormous shrinkage in the price of Pig Iron, a reduction is a necessity.

One of the interesting transactions of the past week has been the closing of an 85-mile Wrought Iron Pipe contract for the natural gas belt at Lafayette, Ind. A works on the Delaware River has captured the lion's share of the order, from 50 to 55 miles, while the balance is taken by Pittsburgh. Eastern Pennsylvania mills are to furnish the material for that part of the order which goes to their section.

Pig Iron.—The event of the week, so far as the New York market is concerned, is the announcement that the rate on Pig Iron from Birmingham to New York, rail and water, has been reduced to $3.50, a cut of 50¢ a ton. It is not surprising in the present condition of affairs that sellers are promptly giving away this reduction to buyers. As yet sellers of Alabama Iron in this market do not seem to have received any positive instructions to withdraw. It is reported that Buffalo furnaces have swept the Canadian market, making large sales of that Iron, with some Southern brands for mixing with it. We quote standard brands $12.50 @ $13.25 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9 75 @ $10.25.

The demand for Pig Iron in the Philadelphia market has been very satisfactory, and while prices are in some cases the lowest, there is nevertheless a better feeling. In standard Foundry Irons there is a steady run of orders, and furnaces are in better shape than they have been for some time. There is a little irregularity in prices, due to the difference in freights to certain points, but on the whole the situation shows improvement, mainly in the better demand, which, however, is a necessary preliminary to better prices. General quotations for Philadelphia or equivalent points are about as follows:

Standard No. 1 Foundry X	$12.50 @ $11.85
Standard No. 2 Foundry X	11.75 @ 12.25
No. 2 Plain	10.75 @ 11.00
No. 1 Soft	11.50 @ 12.00
No. 2 Soft	10.75 @ 11.00

In Chicago the trade in local Coke Irons has latterly been confined to carload orders almost entirely, but they have been fairly numerous. Advices received from the Southern furnace companies state that they are very much disturbed over the strike among the Coal miners. Consumers, however, are not buying much Southern Iron at present, so that the strike in the South will hardly cause much annoyance in this section. Prices thus far have not been affected. The greater part of the trade now occurring is with country customers, as the city foundry trade has been decidedly curtailed by the local building troubles. Lake Superior Charcoal continues very quiet. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @ $15.50
Local Coke Foundry, No. 1	11.25 @ 11.50
Local Coke Foundry, No. 2	10.50 @ 11.00
Local Coke Foundry, No. 3	10.00 @ 10.50
Local Scotch	11.50 @ 11.75
Ohio Strong Softeners No. 1	12.50 @ 13.50
Southern Silvery, No. 1	..... @ 11.50
Southern Silvery, No. 2	..... @ 11.00
Southern Coke, No. 2	10.00 @ 10.35
Southern Coke, No. 3	9.75 @ 10.00
Southern, No. 1, Soft	10.25 @ 10.50
Southern, No. 2, Soft	9.75 @ 10.00
Tennessee Charcoal, No. 1	15.00 @ 15.50
Tennessee Charcoal, No. 2	14.50 @ 15.00
Alabama Car Wheel	17.85 @ 18.00
Jackson County Silvery	15.00 @ 16.00
Other Ohio Silvery	12.50 @ 13.00

The Coke strike is the disturbing influence in the Pittsburgh district, and will probably cause an advance in the market prices of Pig Iron. Foundry Irons are in very light demand, the foundries, as a rule, not being employed to more than half capacity. A sale is noted of fifty tons No. 2 Foundry at a price equal to $10.25, Pittsburgh. Quotations are given as follows:

No. 1 Foundry	$11.00 @ $11.25,	cash.
No. 2 Foundry	10.25 @ 10.50	"
No. 3 Foundry	9.75 @ 10.00	"

There has been little or no business in Pig Iron in Southern markets during the week, for the furnaces were not disposed to take orders for fear they might not be able to obtain Coal for an indefinite time, although they do not look for a prolonged contest. On the other hand, consumers of Iron do not require immediate supplies and are getting enough on contracts for their current necessities. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$10.25 @ $10.50
Southern Coke, No. 2	9.25 @ 9.50
Southern Coke, No. 3	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.00 @ 14.50
Lake Superior Coke, No. 1	12.50 @ 13.00
Lake Superior Coke, No. 2	11.50 @ 12.00
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.00 @ 13.50
Tennessee Charcoal, No. 2	12.00 @ 12 50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable	16.25 @ 16 75

Metal Market.

Pig Tin. — Prices have averaged somewhat below the highest point reached last week. On prompt deliveries 19 50¢ net cash for 5-ton lots was touched. May and later deliveries could have been secured at 0.5¢ @ 0.10¢ discount. From the extreme lowest figures a slight reaction took place toward the close. carload lots having been sold at 19.60¢ net cash during the past few days. There has been very little speculative business and not more than fair average buying for interior account or for consumption. Fresh supplies continue to be quite in line with the consumption. At the close the market seemed quite stiff, with prices on the basis of 19.60¢ @ 19.65¢ net cash for Straits, prompt delivery. Jobbing prices for small lots are unchanged at about 21¢ @ 21¼¢ for Straits Pig and 22¢ @ 22½¢ for Bars.

Copper.—The strike on the Great Northern Railroad has seriously interfered with mining and smelting operations in Montana. That interference, in turn, has caused some operators to purchase supplies in other quarters to fill outstanding contracts. In one instance about 300,000 lb Electrolytic were taken at 9¼¢ for such purpose, and it is understood that other purchases have been made. Apart from this the market is bare of new feature, only routine business being under way in Lake Superior Ingot or Casting Copper. Prices have varied in a slight degree only from 9¼¢ and 9¢ @ 9¼¢ for the respective varieties. The consumptive demand continues moderate and the volume of orders and inquiries received by dealers is still below the average. Prices remain at the level of the past few weeks, with a tendency to harden. Small lots of Lake Ingot from store are quoted at 10½¢ ℔ lb.

Sheet Copper.—Merely a routine business is doing in this material. Orders are mainly for small lots for present use; and there is yet little indication of any general replenishment of attenuated stocks. Cornice makers are waiting for better encouragement from the building industry.

Pig Lead.—Business here has been unimportant and involved only a few hundred tons all told. The transactions were mostly at 3 45¢ @ 3.47½¢, with single carloads at the last named price. There is no change in the general situation save that buyers in this vicinity are more reserved and not bidding 3.45¢ as freely as they did a week ago. Speculative interest is still extremely tame and consumers evince but little interest in buying at the present time. For small lots of Pig 3¾¢ @ 4¢ ℔ lb is the ruling quotation.

Spelter.—Sharp competition, in which two of the largest Western producers figured most prominently, has some-

what demoralized the market, and at present values are very uncertain. Sales have been made of common Western at 3.50¢ delivered here, prompt shipment, and some lots were purchased at 3.25¢ in St. Louis for Eastern account. In the face of this bids were made on 'Change of 3.52½¢ @ 3.57½¢ for July and later deliveries. Latterly there haa been more or less curtailment of production, equivalent, it is estimated, to 25,000 tons per year. This was due mostly to losa in aelling at late pricea.

Sheet Zinc.—The manufacturers have reduced the price of Sheet Zinc atill further thia week. The demand continues quite limited, however, and prices for jobbing quantitiea show no change.

Antimony.—Merely routine business has passed, but enough of it to keep prices quite steady at 8¾¢ @ 8¾¢ for Hallett's and 10¢ @ 10½¢ for Cookson's, with a premium of about ¼¢ on small lots.

Nickel.—The popular price for round lots is 40¢. Small parcela bring 3¢ @ 5¢ more. Only routine demand is experienced here.

Tin Plates.—Aa regards imported Plates, buainess haa been exceedingly slow. Wholesale orders for spot goods have fallen below the average, and in numerous inatances sellers have shaded the prices generally quoted to the extent of 5¢ ₱ box on orders involving only a few hundred boxes. Forward shipments, although offered at somewhat lower prices, have met with very limited sale. In general, the orders received by jobbers run comparatively light, but are, perhaps, more often repeated. Roofing Plates are growing in demand weekly as the building season advancea, and the domestic manufacturers are kept busy in filling orders. Prices for Domestic Plates hold their own in thia market.

In regard to the Western Tin Plate trade, our Chicago advices run as follows: "Tin Plate gives aome indications of a stiffening in price. Spot lots of Roofing Plates and Coke Tin are very firm on account of the smallness of stocks. The American makers are overwhelmed with work and are running behind on deliveries, while stocka in importers' handa are lighter than ever before known. The stocks of large architects have been completely exhausted, as importers will not keep any quantity of thia on hand on account of tariff uncertainties."

A London cable dispatch to *The Iron Age* of April 25, reports that the depression in the British Tin Plate market is more severe after recent improvement. Sellera are yielding slightly to induce business, but make no quotable reduction in pricea. Further concesaions could not be made without positive losa. There is slightly more inquiry for Canada Plates, and some fair orders have been placed for Oil aizes. Liverpool quotationa are as follows:

IC Charcoal, Alloway grade.....12/ @ 12/6
IC Bessemer Steel, Coke finish. ...11/3 @ 11/6
IC Siemens " " " .....11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20.....Nominal.
Charcoal Terne, Dean grade.....10/3 @ 10/6

Wm. A. Stokes & Co., 30 Warren street, New York, are the general agents of the G. M. Shirk Mfg. Company, manufacturers of the North Star Refrigerators. One of the main features of this construction is a combination of dead air space and granulated cork for insulation, for the purpose of economizing the ice consumption. It is pointed out by the makers that the cork will neither settle down nor absorb moisture, and is an excellent nonconductor.

Chicago Report.

Scrap.—The demand for Old Material growa worse inatead of better. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Dealers are doing very little now, as it is between seasons. They are, however, watching the progress of the miners' strike with much interest, as stocks will be heavily drawn upon if the strike should continue for any length of time. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5 25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6 75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6 55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

Attention is called to the advertisement in this issue of the H. Mueller Mfg. Company of Decatur, Ill. The company are manufacturers of Water and Gas Specialties. Among these are Water Pipe Tapping Machines, which can be used without shutting off the water on the mains or wetting the operator, no matter what the pressure may be. They are described as so easily operated that skilled labor is not necessarily required in making a tap. The Mueller Water Pressure Regulator is another specialty, by the use of which a uniform low pressure can be established in house supply pipes regardless of high or unsteady pressure in the mains. This Regulator is not only useful in preventing the leaking of house boilers by too great a pressure, but it is also valuable in buildings having hydraulic elevatora to prevent the breaking of cablea and to make elevatora run uniformly. The company's line covers Corporation Stop Cocks, brass Water Connectiona, brasa Soldering Nipplea, Round Way Stop and Stop and Waste Cocka, brass Plugs, lead Goose Necka, Check and Waste Hopper Cocks, &c., all their goods being warranted.

CONDITION OF THE

Hardware Trade.

THE VOLUME of business is not as large as last April, and during the month there has not been the increase which was anticipated by some. In view of the general practice of purchasing only such goods as are imperatively required for immediate sale or necessary replenishing of stocks, some merchants are supplying their wants from jobbers rather than from manufacturers to a greater extent than heretofore. At the same time an unusual number of orders for comparatively small quantities are received by manufacturers. In fact, jobbers, manufacturers and commission merchants refer to the number of orders which are received as comparing well with any previous season, while the quantity of goods handled is less than usual. The fact that prices are low has the effect also of still further diminishing the aggregate of business as expressed in dollars and cents. Business on the whole is doubtless in a more healthful condition than for some time, and all kinds of goods are going more evenly into the hands of the trade. Prices show no improvement and in many goods the market is weak. Quotations also from jobbers and manufacturers vary considerably, there being an evident desire on the part of all sellers to obtain such business as is to be had. There continues to be a good deal of cutting of prices on the part of jobbers, some of whom are sending out special quotations to induce orders from houses who have not been purchasing with what they consider sufficient liberality. In this condition of things the judicious purchase of Hardware requires careful attention and constant effort to keep posted as to the changes in price which are occurring. Collections give no ground for complaint.

Advices from Chicago.—Shelf Hardware jobbers report their conntry trade fair, and even their city business is not as dull as had been anticipated when the building strike begun. The past week, in fact, has seen a slight improvement. Orders are considerably more numerous than they were, but they are for small quantities only, showing that merchants are still buying from hand to mouth. Seasonable goods are not active at present. The Refrigerator trade is slow and is not expected to show much improvement until the advent of warm weather. Manufacturers of Wire Cloth are again talking about a shortage. Jobbers are quoting $1.45, and this price is held quite firmly in view of a probable short supply. The demand for poultry netting is large, and manufacturers are considerably behind in their deliveries on contracts. Jobbers' sales this year are practically double those of last year. This is now the hight of the season for this branch of trade. Steel goods are quiet. Haying Tools are moving much more slowly than last year at this time, when the prospects for a heavy hay crop were so bright. Some improvement is noted in the demaud for house furnishing goods, tinners' stock and tinware generally. Mail business is picking up in this line. Heavy Hardware is in a little better demand than last week, but trade is spasmodic, a day of big business being succeeded by two or three dull ones.

Notes on Prices.

Wire Nails.—The demand for Wire Naila continues active and of the aame general character that has prevailed for some weeka. Some large orders are

being placed from time to time, but the great bulk of the business is in orders of moderate size. The mills are fully occupied, but are desirous of having their production for some weeks to come covered by orders in hand, and are consequently moving energetically for such business as is in sight. The price of Wire Nails remains as at our last report, 95 cents for carload lots at factory being a representative quotation, but attractive orders can command 90 cents, a price beyond which we do not hear of any sales. Small lots from store in New York are held at $1.15 to $1.25.

Advices from Chicago.—Manufacturers' agents report city trade extremely dull, but orders are coming in for fair quantities from country merchants. The consumption in the country generally appears to keep up very well. The demand is considerably below what manufacturers would like to see, and they are again making more vigorous efforts to sell. Prices are therefore still drooping, and are now down close to $1 Chicago. Jobbers report a smaller demand from stock, and have lowered their prices for small lots to $1.10 to $1.15.

Cut Nails.—There is little change in the Cut Nail market. Prices are still affected to some extent by Western competition, and in parts of the Eastern territory which are accessible to the Western mills the manufacturers are meeting Western prices and departing to a certain extent from the policy which was adopted some time ago to quote only delivered prices in the several markets. The low freight rates which are prevailing are also favoring the Western mills, as they are at present able to place Nails at points which heretofore they have not been able to touch. The price of Nails delivered in New York is 95¢ to $1 base, small lots from store in New York being regularly quoted at $1.10 to $1.15.

Advices from Chicago.—Manufacturers report a moderate trade, which is fully as large as they have reason to expect at this season. Factory prices are still quoted at 95¢ Chicago on 55¢ average. Jobbers quote small lots from stock at $1.05 to $1.10.

Barb Wire.—The demand for Barb Wire continues fair, but prices are uneven and the tone of the market not so strong as a few weeks ago. The market is represented by the following quotations for Four Point Galvanized, delivered at the points named: Pittsburgh, $2.05 to $2.15; Cleveland, $2.10 to $2.20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.25 to $2.35, but it is probable that these quotations can be shaded.

Advices from Chicago.—Local manufacturers are still full of work, and in some cases are behind with their deliveries on contracts. Eastern manufacturers, however, seem to have caught up with their orders, as their representatives are soliciting trade in this market and promising prompt delivery. Quotations on factory lots of Galvanized Barb Wire are now about $2.15, Chicago. Jobbers report a much better demand from stock than for Nails, and quote small lots of Galvanized at $2.30 to $2.40.

Wire Cloth.—On account of the depression which has for some time prevailed in all lines of business, less than the usual quantity of Wire Screen Cloth was manufactured for the present season. The demand for this article is now setting in actively on the jobbers, and the manufacturers are receiving supplementary orders from those whose purchases were made a few months ago, and the result is that their stock is becoming very short and promises soon to be exhausted. In this condition of things manufacturers who have the goods on hand are advancing their prices with the prospect of still further advances in the near future. The market is thus quotably stronger owing to the scarcity.

Sheet Zinc.—Matthiessen & Hegeler Zinc Company, La Salle, Ill., since the discount sheet on Sheet Zinc referred to in our last issue have sent out two further changes, each being in the way of reduction. The price continues $4.50 for Sheet Zinc in 600-pound casks, of the thicknesses between Nos. 9 to 15, inclusive, and of the widths between 32 to 46 inches, and of the lengths between 84 to 90 inches. The extras are also unchanged. The discounts announced, under date April 18, are as follows:

Discounts.	First class. 15 600-pound casks and upward.	Second class. 10 to 14 600-pound casks.	Third class. 5 to 9 600-pound casks.	Fourth class. Under 5 600-pound casks.
	Per cent.	Per cent.	Per cent.	Per cent.
Special	15	15	15	15
Cash with order	3	3	3	3
Quantity	3	2	1	0
Totals	21	20	19	18

All discounts are computed straight when money accompanies the order. Quantity discount is added to special discount in all cases. If remittance is received within 10 days of date of invoice the cash discount will be only 2 per cent. instead of 3 per cent., and not computed straight. Each order is strictly subject to the quotation of the class to which it belongs.

Glass.—There has been no radical change in the condition of the Glass market during the past week, though prices show an upward tendency. An increase is noticed in the number of factories in operation, which would indicate that manufacturers anticipate an increased demand and remunerative prices. A State organization of Indiana manufacturers has been formed, which has resulted in a stiffening of prices in the gas belt. The New York Window Glass market is represented by the following quotations: Single and double strength Glass in small quantities, 80 and 20 per cent. discount; in 1000-box lots, single, 85 per cent., and double strength Glass, 85 and 5 per cent. discount. Pittsburgh factory quotations are reported as 85 per cent. for single, and 85 and 10 per cent. discount for double strength Glass. New York Plate Glass quotations remain 70 and 10 per cent. discount.

Old Metals.—Business is hardly as good as it was a week ago. Some grades of Scrap Iron are, however, in fairly good demand, but bids are below the views of holders. Trade is consequently checked. Prices are irregular and somewhat weak. The following quotations represent about the ruling rates in New York:

Heavy Copper	℔	7½¢
Light and Tinned Copper	℔	6½¢
Heavy Brass	℔	5½¢
Light Brass	℔	4½¢
Lead	℔	3¢
Tea Lead	℔	2¢
Zinc	℔	2¾¢
No. 1 Pewter	℔	14¢
No. 2 Pewter	℔	7¢
Wrought Scrap Iron, ℔ gross ton	$9.00 @	....
Heavy Cast Scrap, ℔ gross ton	7.00 @	....
Stove Plate Scrap, ℔ gross ton	4.50 @	....
Burnt Iron, ℔ gross ton	3.00 @	3.50

Old Rags, Paper, &c.—There has been a more active demand, and prices for Paper stock and Woolen mill supplies are pretty steadily maintained. Quotations as follows:

No. 1 White Rags	℔	lb 3¼ @	3½¢
No. 2 White Rags	℔	lb 2 @	2½¢
Mixed Rags	℔	lb	2¼¢
Blues and 3ds	℔	lb 1 @	1¼¢
Hard Sized White Shavings	℔	lb 2¼ @	2½¢
No. 1 White Book Shavings	℔	lb 1¾ @	2 ¢
No. 2 White Book Shavings	℔	lb 1 @	1⅝¢
Light Book Shavings	℔	lb	¾¢
No. 1 Mixed Shavings	℔	lb ¾ @	1 ¢
No. 2 Mixed Shavings	℔	lb ½ @	¾¢
No. 1 Printed Books	℔	lb 1 @	1¼¢
Ordinary Mixed Books	℔	lb ½ @	¾¢
Newspapers	℔	lb 2-5 @	½¢
No. 1 Manila Paper	℔	lb 1 @	1⅛¢
No. 2 Manila Paper	℔	lb ⅝ @	¾¢
Bogus Paper	℔	lb	½¢
Common Paper	℔	lb	⅜¢
Straw Chips	℔	lb	½¢
Binders' Clippings	℔	lb ½ @	⅝¢
Jute Butts	℔	lb 1⅞ @	2 ¢
No. 1 Jute Bagging	℔	lb 1 @	1¼¢
Mixed Bagging	℔	lb ¾ @	1 ¢
No. 2 Bagging	℔	lb ½ @	¾¢
Hemp Twine	℔	lb 2 @	2¼¢
Manila Rope	℔	lb 2¼ @	2⅜¢
Jute Rope	℔	lb 1½ @	1¾¢
Mixed Rope	℔	lb ¾ @	⅞¢

Old Rubber.—The market for Old Rubber is fairly good. Prices rule about as follows, but are subject to variation and are somewhat irregular:

Car Springs, ton lots, ℔ lb.	.... @	$0.03½	
Rubber Shoes, carloads, delivered at factory, ℔ lb.	.... @	.03⅛	
Rubber shoes, less than carloads, ℔ lb.	@	.03¼	
Large Hose, ℔ ton	.... @	12.00	
White Wringer Rolls, ℔ lb.	.... @	.03¾	
White Syringes, ℔ lb	@	.03¾	

Trade Notes.

An unusually striking announcement is made elsewhere in this issue by the Perfection Furnace Pipe Company, Broadway and Logan street, Toledo, Ohio. In the two-page display they show a large number of goods that are of interest to the trade, and those who have use for such articles are invited to send to the company for their catalogue and price-list.

The announcement elsewhere of N. & G. Taylor Company, Philadelphia, Pa., relates to Columbia guaranteed Terne Plate, which is described as a high grade, heavily coated Terne Plate, made from the finest quality of rehammered Siemens-Martin soft steel. The sheets are resquared and stamped.

The contract for all the Steel and Iron Work for the new Pulaski County jail, at Dublin, Va., was recently awarded to E. T. Barnum, Detroit, Mich.

The Excelsior Steel Furnace Company, 38 West Monroe street, Chicago, make an interesting announcement in their advertisement in this issue.

Occupying part of their space is a coupon which will be received by them as the equivalent of $1 in payment for a first order of Furnace Stacks or Fittings amounting to $10 or more. The company manufacture all kinds of fittings, and are prepared to fill orders as soon as received.

Among recently chartered corporations in New York State is the Glazier Headlight Company of Rochester. N. Y., to manufacture Headlights, Lanterns, and Sheet Metal Goods. The directors are: Elias C. Glazier, Nellie A. Glazier, Frank P. Siddons, and others of New York City. Capital $6000.

The building now under erection by the Canton Rolling Mill Company, Canton, Ohio, is rapidly approaching completion, and is expected to be finished about July 1 next. The new concern will engage in the manufacture of Iron and Steel Sheets and expect to turn out from 25 to 35 tons per day. The building is of iron and is being erected by the Canton Bridge Company of Canton, Ohio. The rolls are being furnished by the Lloyd Booth Company of Youngstown, while Wm. Tod & Co. of the same place will supply the engine, and Reeves Brothers of Alliance, Ohio, have the contract for the boilers.

The Chester Pipe & Tube Company, Chester, Pa., give notice of a proposed increase in their capital stock. It is said that this action has been in contemplation for over a year, and that advantage will now be taken of the very low prices of materials to make the improvements which the management has had in mind.

The American Sheet Iron Works, Philipsburg, N. J., were again shut down this week for lack of orders.

The McDaniel & Harvey Company's mills, at Wilmington, Del., and at North East, Md., are running full on orders for Sheet Iron.

Cost of Melting.*

There is probably less known about the actual cost of melting iron in cupolas for foundry work than about any other branch of the foundry business. But few foundrymen make any attempt at keeping a cupola or melting account. Many of those who do, keep it in such a way that they not only fail to learn the cost of melting, but are misled by the account to suppose their melting costs them a great deal less per ton than it really does. In the majority of foundries the melting is left entirely in the hands of the melter, who as a rule has no system for doing the work, and has no control over his assistants or interest in having them do a fair day's work. In many of the foundries I visit twice the number of men are employed as cupolamen as are employed in melting the same amount of iron in other foundries, where the facilities for handling the stock are almost the same, and the expense of lining and daubing material is frequently double with one melter what it is with another in the same sized cupola with the same sized heats.

In many foundries the fuel is not weighed, but is measured in baskets, or the number of shovels counted and the weight estimated. When the fuel is measured in baskets the baskets always stretch and enlarge, and an old basket frequently holds one third more than a new one; from 10 to 20 pounds more can easily be piled on the top of a basket after it is filled. Foundrymen who charge their fuel by the basket always use more fuel than they estimate they are using; when the shovels are counted, each shovel may be made to weigh more than is estimated, and a few extra shovelfuls are always thrown in, for fear some were not full. When too much fuel is used in a cupola there is not only a wastage of fuel, but there is slow melting, increased destruction of the lining and an increased wear and tear of the blast machinery. For these reasons every pound of fuel that goes into the cupola should be accurately weighed. Even when the fuel is supposed to be accurately weighed there should be some check on the melter, for he will shovel in extra fuel if not watched.

At a foundry I recently visited in New Jersey an accurate account of the melting had been kept for a year. At the end of the year the president of the company had figured up the amount of fuel consumed in the cupola and compared it with the amount purchased, and found they were short 260 tons. At another foundry, where the melter always reported melting 7 pounds of iron to 1 pound of anthracite coal, they ran short 300 tons in a year. This kind of work should be prevented by checking up the melter's report and comparing it with each carload of fuel consumed.

A cupola book should be provided, with blank spaces for recording the weight of coal or coke in the bed and charges, and the weight of each brand of iron, No. 1, 2 or 3 and scrap, showing the exact mixture of each charge and heat. A note should also be made of the quality of iron produced from the mixture. Such a record is of great value in making mixtures and charging a cupola, if it is properly kept.

The cost of melting per ton is figured in a number of different ways, but to be of any practical value the entire cost of melting should be figured on as follows:

Interest on cost of cupola plant and depreciation in value of same.

Fire brick for relining and repairs.

Fire clay, loam and sand for cupola and ladles.

Repairs to cupola, blast pipe, elevator, scaffold, runway, blower, &c.

Belts, oil, &c., for blower.

One-fourth the entire cost of engine.

Tools, wheelbarrows, buckets, hose, shovels, forks, rakes, hoes, sledges, picks, bars, trowels, bod sticks, tap bars, &c.

Wood for lighting up and dredging ladles.

Coal or coke consumed in melting.

Labor employed in removing the dump, making up cupola, milling dump and gates, collecting gates, scrap and bad casting from foundry, placing iron and fuel on scaffold, charging, breaking and piling iron in yard, breaking up bad castings, daubing ladles, &c.

When the cost of all these items has been learned, and the amount divided by the number of tons melted, it will be found that the cost of melting is about $2 per net ton of iron in the ladles. In foundries with all the modern improvements for handling the stock the cost is a little less than $2 per ton, and in foundries with none of the improvements for handling the stock and no system in melting the cost per ton is as high as $3. When there is doubt as to the accuracy of weights in charging, the weights should be compared with the fuel purchased and castings sold, and the cost of melting may be figured on the weight of castings sold in the place of the amount of iron melted. To make a cupola report of value the fuel, labor and tool accounts should be kept separate, and an effort made to reduce the expense of each account.

* Paper by Dr. Edward Kirk, read at the last monthly meeting of the Western Foundrymen's Association.

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Metal and Miscellaneous Prices.

CHICAGO, APRIL 26, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	16.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	36.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20. $9.25
Royal, extra, IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.60

Roofing Plates.

Palm, IC, 20 x 28.....@$11.25
Palm, IX, 20 x 28.....@ 14.00
Empire, IC, 20 x 28.....@12.00
Empire, IX, 20 x 28.....@15.00
Hickory, IC, 20 x 28.....@ 12.50
" IX, 20 x 28.....@ 15.50
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 15.00
" IX, 20 x 28.....@ 18 00
Merchant's Roofing (extra coated), IC, 20 x 28.....@$17.25
Merchant's Roofing (extra coated), IX, 20 x 28.....@$21
Merchant's Old Method (extra heavily coated), IC, 20 x 28.....@$18.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28.....$22.60
Westmoreland:
IC, 14 x 20..... $6.00
IC, 20 x 28..... 12.00
Elwood:
IC, 20 x 28..... $11 50
Furniston:
IC, 20 x 28..... $11.00
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50
Illinois, Old Method:
IC, 20 x 28.....$17.00
E. L.:
IC, 20 x 28.....$12.50
Jessie:
IC, 20 x 28.....$12.00
Scott's Extra Coated, Stamped and Resqured, IC, 14 x 20.....$9.50
Scott's Extra Coated, Stamped and Resqured, IX, 14 x 20 .....11.00
Scott's Extra Coated, Stamped and Resqured, IC, 20 x 28.....19.00
Scott's Extra Coated, Stamped and Resqured, IX, 20 x 28.....22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28.....12.50
" " IX, 20 x 28.....15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resqured).....$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resqured).....19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resqured)..... 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resqured).....16.50
Columbia, IC, 14 x 20 (Stamped)..... 7.25
" IC, 20 x 28 (Stamped).....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28..... 13.00
Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28.....12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28.....12.00
Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
" (Redipped), IC, 20 x 28.....17.00
Old Process:
IC, 14 x 20..... 9.25
IX, 14 x 20.....11.25
IC, 20 x 28.....18.50
IX, 20 x 28.....22.50
H. B. L., Old Style:
IC, 14 x 20..... 7.75
IX, 14 x 20..... 9 25
IC, 20 x 28.....15.50
IX, 20 x 28.....18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 3-10¢	3 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5-10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality..... dis. 75%

Copper—

Ingot.

Lake.....10½¢ @ 11¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list, 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.38
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter.....6

Sheet Zinc—

600 ℔ casks.....50¢
300 ℔ casks.....4.70¢
Loose sheets.....4.80¢

Lead—

Soft Pig Lead.....4 ¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....13¢
Hallett's.....12¢

Wrought-Iron Pipe—

1¼ and under, Plain	60&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	70&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz.	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1¾¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6½¢
" Ground in oil, Red	℔ D, 6½¢
" Ground in oil, Brown	℔ D, 5½¢
" Ground in oil, Purple	℔ D, 8 ¢
Linseed Oil, Boiled, in bbls	52¢
Linseed Oil, Raw, in bbls	49¢
Mineral Paints	2@4¢
Orange Mineral	9¼¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¼¢; kegs	7¼¢
Sipe's Japan Oil, in bbls, ℔ gal	84¢
Spirits Turpentine, in bbls., ℔ gal	34½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, APRIL 27, 1894

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:

Small lots	℔ D, 75¢
100-℔ lots	℔ D, 73¢
Ton lots	℔ D, 70¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots	℔ D, 70¢
100-℔ lots	℔ D, 65¢
Ton lots	℔ D, 60¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	℔ D, 65¢
100-℔ lots	℔ D, 60¢
Ton lots	℔ D, 55¢

Antimony—

Cookson.....℔ D, 10¾¢
Hallett's.....℔ D, 9¾¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.
¾-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝-in.	.38
⅜-in. up to ½-in.	.41
5-16-in. up to ⅜ in.	.48
¼-in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 18, inclusive,	.38

25 @ 30%

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats...12¢ ℔ D, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10 ¢
Ansonia Grade Casting.....9¼¢
Planished.....net
Sheet and Bolt.....15¢ ℔ D, net, basis

Tubes — See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2.50	2.80¢
Nos. 17 to 21	℔ D, 2.60	2.90¢
Nos. 22 to 24	℔ D, 2.70	3.00¢
Nos. 25 and 26	℔ D, 2.80	3.10¢
No. 27	℔ D, 2.90	3.20¢
No. 28	℔ D, 2.95	3.30¢
American B. B.	℔ D, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12¾¢
Patent Planished ℔ D, A, 10¢; B, 9¢. 5%
Craig Polished Sheet Steel.....℔ D 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75@75&10%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....3¾¢@4¢
Bar.....4½¢
Pipe.....5¾¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2¾¢ ℔ D.

Metal Exoanded—

Manufacturers' list No. 6.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls	6¾ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil:	
Raw, ℔ gal.	@ .40
Boiled	@ .43
Spirits Turpentine:	
In bbls.	@ .32
Putty:	
In barrels and ½ bbls	.01¾ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01½ @ .02½
In bladders	.01¾ @ .02¼
Roofing Material, &c.:	
Asphaltum, Trinidad Refined, ℔ ton	$30.00@$35.00
Asphaltum, Rock, ℔ ton	$14.00
Coal Tar Felt, 1 Ply, ℔ D	2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft.	$1.85
Roofing Pitch, ℔ bbl.	$2.25

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, May 5, 1894.

DAVID WILLIAMS, - PUBLISHER

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CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....812 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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A Word About Valves.

Nothing is more essential to successful steam and hot water heating work than reliable valves. Unfortunately, the intense competition for heating contracts of late years has fostered a disposition on the part of contractors to buy everything of the cheapest; and thus has been created a demand for cheap valves. Now it is a fact that a good valve cannot be produced within a certain limit of cost, and if this line be passed, the quality of the article, while it may suffice for a brief period of use, is sure to give no end of trouble long before a good valve should manifest any symptoms of failure. For instance, a pair of new valves fitted to a steam radiator last fall, though receiving no extraordinary usage, now leak so badly that, when closed, the radiator fills with water and when steam is let on the radiator becomes a "thunder box." The best valves obtainable still have some defects that it would be desirable to remove; the cheaper, poorer varieties are, many of them, all defects.

Weight in Valves.

If a valve body be cast too light it springs easily, and pressure on the seat when closing it causes the seat to yield permanently: it will then leak till the faces of both disk and seat are again ground to fit and will soon give way again in use. A brass globe valve used in a brewery burst by freezing not long ago. Examination of the structure showed so little thickness in the walls of the globe as to render it surprising that it could have been cast so thin. Inquiry disclosed the fact that the valve had leaked almost from the beginning of its use; and doubtless this was expected by the makers, who presumably know enough about valves to understand what has been said above, and who would justify themselves for making inferior goods by the assertion that they would not make them from choice, and do so only because the trade has set up a demand for them. The excuse is valid. Manufacturers must meet the demands of their trade or go out of business.

Can a Hard Seat Valve Close Tight?

There are steam heating engineers who assert that all hard seated valves will leak a little, no matter how well made, unless, after the first closing, they are tightened down again when the stems have cooled. That in cooling after closing the contraction of the stems relieves the pressure of a valve disk upon its seat is certain; whether this is sufficient to slightly open the valve depends probably somewhat upon the elasticity of the material. If the elasticity be sufficient to compensate for the contraction the valve should remain tight; but it would be a very nice job to so relate the elasticity to the contraction as to absolutely insure that a hard seat valve shall remain perfectly tight with once closing. The rule is probably, as the engineers referred to assert, that hard seat valves cannot be relied upon to remain absolutely tight. But the fact is that before the era of cheap valves those with hard seats did give reasonably good service.

Procrastination.

Business and manufacturing houses, like men, have their characteristics, their vices and their virtues. Generally these can be traced to the managing man and his character found reflected in all the actions of the concern as a corporate body. But frequently, through years of continuance in certain methods and customs, the entire establishment becomes satnrated with the spirit of him who governs, and remains so long after his departure, notwithstanding the earnest efforts of his successors to turn it from its course. Procrastination, that everlasting habit of putting off things until some other time, whereby everything is always just so far behind, stands out as prominent in many a concern as it does in a multitude of men. The delay of the cobbler and the tailor we somehow take as a matter of course, but the otherwise reputable concern that delays and exasperates us in the greater things of life we frequently set down as unworthy of confidence and our further patronage. The strange thing about procrastination is that it seems only necessary to catch up once for all and then orders would continue thereafter to be filled on time. But the habit once formed is not so easily conquered, and the concern is soon back in the old rut again. Some managers appear to work on the principle that it is best to be just a little behind time, so that there may be urgent cause for rushing the men and thereby getting more work out of them. It takes but a short time and a very moderate intellect to see through the game, however, and therefore the workman's actions are governed accordingly. The waste of material through haste, the poorer resulting workmanship, the additional cost of explanatory letters and telegrams or the time spent in making personal apologies for delay, go far to show the disastrous financial effects of procrastination. The habit will be hard to break and rules will be difficult to follow, but success will attend only when—1. No promises are made that cannot be fulfilled. 2. A sufficient stock of material is kept on hand or the same is ordered promptly enough to cause no delay for lack of it. 3. One thing at a time is completely fiuished, instead of dropping one job to take up another, because of the importunity of a customer. 4. A thing is pnt out of sight as soon as it is completed. And finally by such careful planning of the work no time is lost; jobs are started in time to be completed at the desired date and a man's abilities are always utilized to the best advantage.

The closing exercises of the evening educational classes of the Young Men's Institute were held on the evening of May 1 in the lecture room of the institute, 222 Bowery, New York. The Rev. Dr. MacArthur delivered the address of the evening, in which he urged the students to be ambitious and keep up their good work. Forty-six diplomas were awarded, and certificates of progress were given to 23 scholars. The presentation of prizes and diplomas was made by W. M. Kingsley, who presided. Prizes were given for efficiency in arithmetic, freehand and mechanical drawing, shorthand, steam engineering and electricity, &c.

A decision affecting nearly every railroad in the country using steam heating in passenger cars was recently handed down by Judge Swan of the United States Court at Detroit against the Michigan Central Railroad. The decision sustains a patent granted to E. D. Cody in 1885, and owned by the Consolidated Car Heating Company of Albany, N Y., on a system of car heating. It holds as an infringement the heating system known as the Martin apparatus, now used by the railroad referred to. The decree grants an injunction against the further use of such steam heaters.

The Madrid correspondent of *Industries and Iron* says that the price of petroleum has been raised lately in Spain to such a point that those who previously used the oil for lighting purposes are now employing electricity.

THE LETTER BOX.

Check Dampers.

From C. E. S., *Clinton, Iowa.*—I would like to hear from the readers of the paper in reference to check dampers used in the smoke pipes of different kinds of hesters. There are two kinds primarily—the first simply turns into the pipe and stops or retards the passage of the products of combustion; the other leaves an opening in the pipe through which the chimney is supplied with air, and stops its draft on the fire. A third kind is a combination of both of the above features, opening into the pipe, partially shutting off the passage and also permitting air to enter to cool the pipe and supply the chimney. The second style of damper mentioned cools the pipe much more than the first, and it is said that there is no loss or waste of heat going up the chimney. Is this true? Do these dampers hold the heat in the hester or do they make the fire slow? It is true that with this method the pipe cools, but is it not caused by the cold air entering? What is the best damper? Is there any difference, and if so, why? Where is the best place to put a furnace damper, next to the heater or next to the chimney? These are questions which are only partly decided in my mind, and I think a discussion of them would be interesting to other readers than myself.

Defective Draft.

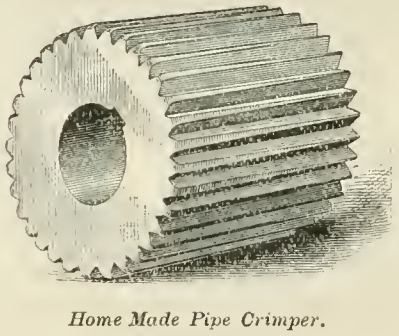
From W. S., *Danville, N. Y.*—I would be glad to receive suggestions from *The Metal Worker* and its readers as to what causes the trouble in two faulty chimneys that are here described: The first chimney is 4 x 12 inches in size and has two stoves connected with it, one pipe hole being 18 inches above the other, the stoves being placed on opposite sides of the chimney in different rooms. The stove which is connected at the lowest opening has a very poor draft, while the one at the highest point has a fair draft. The chimney creosotes so badly that it runs down on the outside of the stack on to the roof and spoils the water which is used for laundry purposes. The chimney is increased in hight by a 7-inch stack, which runs up several feet higher than any of the surrounding buildings. The fault is not with the lower stove, as it worked perfectly when connected with another chimney.

The other chimney has but one stove connected with it, but it creosotes much more than the first chimney. It runs down into the smoke pipe and forms a crust that eats up the pipe in from four to six months. The stove is connected to the chimney by the use of two 45° elbows, so as to give the smoke an easy turn, and there are 2 feet of pipe between these two elbows. What puzzles me is that everything worked first-rate for the last eight years, or up to within a year ago, when the trouble began. The chimney is as high as any of the surrounding buildings, but there are several trees in front of the house, 25 feet from the chimney and possibly 10 feet taller. I shall be greatly obliged for suggestions, and hope some of the readers will give me a pointer or two.

Note.—We trust our readers will discuss this subject. It would seem to us that the first chimney was entirely too small and of a wrong shape to do good work, particularly with two stoves, and from the fact that the smoke cannot get up the chimney fast enough it condenses on the sides of the chimney and makes the trouble reported. The dimensions of the second chimney are not given, but a consideration that would be likely to affect both chimneys is the eating out of the lime in the mortar which cements the brick work, when air would enter to interfere with the draft.

Home Made Pipe Crimper.

From B. C. & Co., *Philadelphia.*—This winter, not being very busily engaged, I concluded I could make a stove pipe crimper of my swedging machine, and made two crimping rolls that would fit on the shafts of the machine for the purpose. I made a pattern of sheet zinc, and when I took it to the foundry I showed it to the foreman and finally asked him if he could make two castings that would be perfectly true from that pattern, and then dropped the pattern in his hand; and as he expected some considerable weight, he nearly threw the pattern in my face because it was so light and made an ejaculation of surprise to find that it weighed so little. There were extensions on the pattern for the core prints, and when I received the castings they had a hole through the center, as shown in the sketch. After the castings were received I filed a slot in the pole to fit over the key on the shaft, and left the edges sharp on one end; but at the other end they were ground flat and round, so that the pipe would not be cut by the machine. These are now slipped on the shaft of my swedging machine, and I can crimp stove pipe first rate. The total cost, without counting my time, was less than 60 cents.



Home Made Pipe Crimper.

The Bell Vapor Stove.

From G. P. M., *Boston, Mass.*—Will some one please give me the address of the maker of the vapor stove which carries on the tank the name "Bell?"

Copper Gutters for a Round House.

From C. B., *Conneaut, Ohio.*—I am interested in a controversy as to whether or not copper is the best metal to use for gutters and cornice work on slate roofs. I have a job on hand that calls for gutters and flashings of 16-oz. copper. I shall be glad to have the readers of *The Metal Worker* give their experience with the use of copper in this connection. I have seen a job of copper gutter work that was put on a round house in 1882, which was torn off within the past year because of its going to pieces, but I do not know what metal was substituted. Lead has been suggested as a better metal than copper.

Note.—We trust our readers will discuss this subject, which is very interesting. No doubt the gases arising from the locomotives in a round house subject the copper to conditions which are different than those which would exist on an ordinary roof exposure. There are a number of buildings in this country having copper roofs which have been in use for more than 100 years, Christ Church of Philadelphia, which has never been painted, being a case in point. The City Hall in New York City is covered with a copper roof, which was put on in the usual standing seam form and has been in use about 50 years. In both cases copper is used for the roof as well as the gutters, the City Hall being exposed to what might be called a salt atmosphere, while the church is so far inland that it is not exposed to the same climatic effect, although the Delaware River prevents the climate from being dry.

Sheathing for Tin Roof.

From A. P. B., *Central Nassau, N. Y.*—In reply to the inquiry of "B. J. T." in *The Metal Worker* of April 14, with reference to sheathing for tin roofing, would give my experience as follows: I have laid a number of thousand feet of tin with the sheathing 2 inches apart, but would advise that the tin be painted on both sides before laying; then there will be no rust between the sheathing boards. I would suggest that he get prepared tin that is all ready for the roof and would advise him to use 20 x 28 redipped tin.

Why Did the Boiler Collapse?

From ZERO, *Riverhead, N. Y.*—Will *The Metal Worker* please ask its readers to explain what caused a copper range boiler to collapse under the following conditions? It was supplied with water from the town main and was in constant use up to 10 o'clock at night, when, on account of zero weather, the water in the house was shut off over night. In the basement below the

boiler there is a set of soapstone washtubs and a water closet. Hot water is drawn from the boiler for the tubs. After the water was shut off from the water main, the bibbs in the washtubs were opened to allow the water in the pipes to run out in order to prevent freezing. The boiler has a usual delivery tube in the center with a hole in it near the top to prevent syphonic action.

Wants to Learn Brazing.

From A. C. R., *Newark, N. J.*—Please let me know through *The Metal Worker* the methods employed in brazing, as followed in railroad repair shops.

Answer.—Too much space would be required to give a comprehensive answer to the questions asked, and we would recommend our correspondent to get a copy of "The Art of Coppersmithing," which can be supplied by the book department of this office.

Hanging Long Gutters.

From O. J. B., *Troy, Ind.*—I send to *The Metal Worker* my method of hanging long gutters and would like to hear from some of my brother tinners on the same subject. Many different styles of eaves are met with, and different styles of gutter and hangers are used. In hanging gutter on a barn 80 feet long I would put up the gutter in two sections of 40 feet each. When the eave projects considerably without any back strip nailed to the end of the rafters, I always have one put up 6 inches or more wide according to the pitch of the gutter. Then I nail my gutter straps to it about 2½ feet apart. I make them out of good tin painted on both sides, and cut them 1 inch wide and 28 inches long. At the center of the strap I rivet or solder another strap half as long to hold the gutter from being lifted up in a wind storm. Having nailed up the straps make a loop of one, as shown in the illustration, about 10 feet from the high end of the gutter, for the work should always commence at the high end. Now place the ladder about 20 feet from the end and pick up a section of the gutter at the middle of the 40 feet and mount the ladder, when if it is not a windy day one end of the gutter can be easily pushed through the loop and the gutter secured by another loop near the ladder. After this, by moving the ladder the other straps can be fastened so as to give the gutter a proper pitch, and the first section is completed. The second section is put up in the same way, and when it is secured the two sections are connected and the straps fastened to maintain a proper pitch through the entire length. When all is securely fastened the open seam between the two sections must be soldered; this completes the work ready for the conductor to be attached to pipe at the low end of the gutter. I sometimes solder the down straps under the bead of the gutter about 10 feet apart, and when properly nailed they hold the gutter securely in place, and the strongest wind will not lift the gutter out of the straps or destroy the pitch.

Hanging Long Gutters.

Fails to Bake on the Bottom.

From H. F., *Chicago.*—I have read the different letters that have appeared in *The Metal Worker* in answer to the inquiry of "W. F.," in the issue of January 20, with considerable interest. Two primary causes for cooking stoves failing to bake are bad fuel and bad management. I have used a large number of stoves during the last 20 years, and have never had any serious trouble in making any stove or range bake on the bottom. There are all kinds of coal on the market and also all kinds of stoves. Very poor fuel is not likely to give satisfaction used in a very cheap stove, and the very best stove made, set up to a good flue, will not work well unless managed properly. Dealers are generally willing to give the instruction necessary for the proper working of a stove, and it is very important that they should do so. I was recently informed by a woman who has a stove that had an excellent reputation that she had used it for three years without cleaning the flues, not even knowing that the flue stop could be removed. Consequently it had failed to give satisfaction, and, to use her own expression, "the stove was good no more." I have used the same kinds of stoves in different chimneys, and have found the stove to work best where the draft was good. From my own experience, I believe that the ranges made by some firms will give better satisfaction than those made by others, and that a well made range of the sheet flue type will cure many faulty chimneys. I always select stoves having full deep flues and an ample fire chamber, and never have any trouble to make them bake on the bottom.

What is a By-Pass?

From A. J. C., *Morristown, N. J.*—Will you please explain in *The Metal Worker* the meaning of a by-pass, as relating to plumbing work? I have read of it quite often, but could never find out the meaning of it.

Answer.—A by-pass is a branch from a main which extends past some fixture and enters the main beyond it. Two stop cocks are placed upon the main between the two by-pass connections, and a branch to some other fixture is taken off between these two stop cocks. When no water is desired in this branch both of the stop cocks on the main are closed and the stop cock in the by-pass connection opened. By this means the water passes by the branch and continues to supply the other fixtures on the main.

Rust Preventive.

From YATES & Co., *Rockford, Ill*—If "A. L. H.," Woburn, Mass., whose letter appeared in *The Metal Worker* April 21, will send us his address we will mail him a pamphlet telling him how to make a rust proof application at 37 cents per gallon, and a first-class paste stove polish at from 3 cents to 6 cents per pound.

OBITUARY.

BIRDSILL HOLLY.

Birdsill Holly, inventor of the Holly system of water works, died at his home in Lockport, N. Y., April 27. He was born in Auburn, Cayuga county, N. Y., October 8, 1820. He received a common school education and then worked at general mechanics and as millwright. After becoming an expert in all kinds of general mechanical work he went to Uniontown, Pa., where he first became superintendent and afterwards proprietor of a large machine shop, which he conducted for a number of years. He then returned to Seneca Falls, N. Y., where he became a member of the manufacturing firm of Silsby, Race & Holly. They produced hydraulic machinery. In 1859 he removed to Lockport, where he resided until his death. He gave his time to the inventions which have made his name far known. He invented a chain stitch sewing machine which had a large sale. He invented and perfected over 150 devices. Some of these in machinery were bought in Europe, where they are now manufactured. But the invention with which his name will always be identified is that of the Holly system of water works. The builders of the systems of engines and pipes, the Holly Mfg. Company, organized in 1859, have now a capital of $1,000,000, employ 500 men, and their works occupy over two blocks in Lockport. They have already placed their system in over 2,000 towns and cities of the United States and Canada, where it is now in successful operation.

The recently enacted anti-monopoly law of the State of Illinois does not appear to operate satisfactorily, if it be true, as stated, that over 15,000 corporations in Illinois have neglected or refused to make a report to the Secretary of State, according to its provisions. About 10,000 only made full reports, while several thousands evaded the law by taking out certificates of dissolution. According to the law the Attorney-General is now bound to bring actions against the 15,000 delinquent concerns, a sufficiently arduous task.

The negotiations for a proposed transatlantic steamship pool have fallen through and will not, it is said, be resumed. A rate war in steerage passenger traffic has been inaugurated between the British and Continental lines of steamers.

THE RETAIL STORE.

The Thomas Hose Nozzle and Sprayer.

The accompanying cuts represent a hose nozzle and sprayer combined, offered by John H. Thomas, Piqua, Ohio.

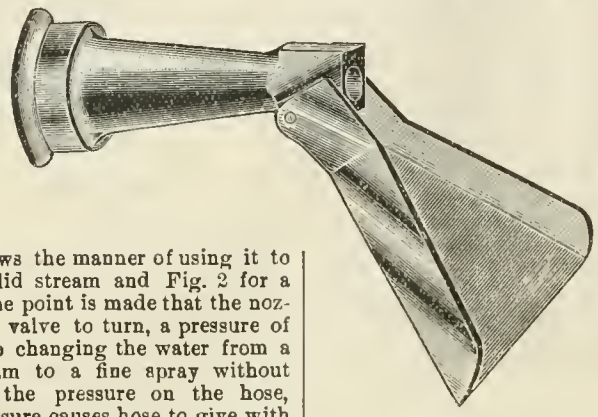


Fig. 1.—The Thomas Hose Nozzle and Sprayer.

Fig. 1 shows the manner of using it to throw a solid stream and Fig. 2 for a spray. The point is made that the nozzle has no valve to turn, a pressure of the thumb changing the water from a solid stream to a fine spray without changing the pressure on the hose, which pressure causes hose to give, with a tendency to collapse. The nozzle is designed for street sprinkling, watering

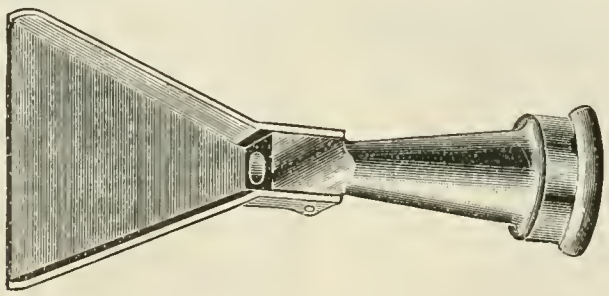
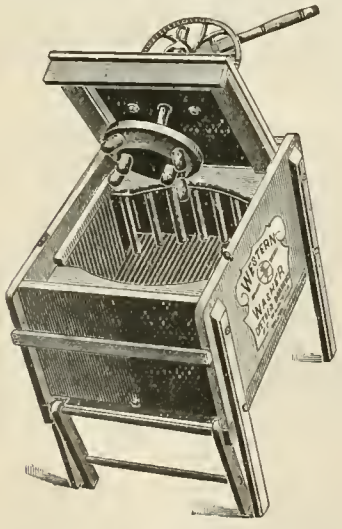


Fig. 2.—Position for Spray.

flowers, lawns, washing buggies, &c., or for any purpose for which a hose is used.

The Western Standard Washer.

Diether & Barrows, Fort Wayne, Ind., are offering the washing machine shown

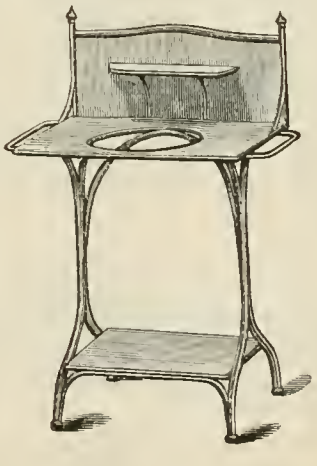


The Western Standard Washer.

in the accompanying cut. An important feature of the machine is a galvanized steel shifting shaft, to which a rubber or pin wheel is attached. The shaft is described as having a free perpendicular movement through the gear wheel, quickly adjusting the rubber or pin wheel to any quantity or condition of the clothing in the washer. The manufacturers claim that the galvanized steel shafts will not shrink, swell, rust, rot, split or break, and that the gearing will adapt itself to a single piece or a tubful, washing any intermediate quantity to perfection. The washers are made in sizes Nos. 2 and 3.

Japanned Toilet Stand.

One of the latest productions in the line of sheet metal furniture is the ja-



Japanned Toilet Stand.

panned square toilet stand, shown in the accompanying illustration. The stand is manufactured by the Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, by whom it has just been placed on the market. Made of sheet steel, the stand is light, yet durable, and is specially adapted for country house or camp use. It is japanned of an ivory white color, resembling enamel, and is easily kept clean, presenting at all times a neat and tidy appearance. It is fitted for the accommodation of all the toilet requisites, and possesses the additional recommendation of economy of space, being but 42 inches high and 30 inches wide.

Hanks' Water Filter.

Bigelow & Dowse Company, Boston, Mass., as exclusive agents for the Hanks Filter Company, are introducing

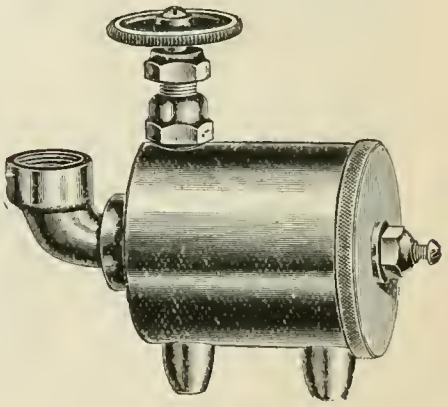


Fig. 1.—Hanks' Water Filter.

the filter shown in the accompanying cuts. The filter is of cast brass, nickel plated, the body being 3 inches long and 3 inches in diameter, and designed to attach directly to the faucet of the water supply pipe. From Fig. 2 it will be seen that the connection with the faucet is made at the elbow, at the left of the cut. To the right of the stop cock is a carbon block, $\frac{7}{8}$ inch thick, which fits the inside walls of the

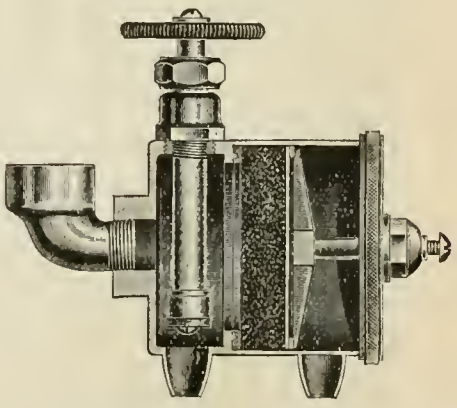


Fig. 2.—Interior of Hanks' Water Filter.

filter closely. This is held closely against the rubber gasket on the flange, by a set screw pressing against a brass spider. Access to the interior of the filter is gained by unscrewing the cap which forms the covering of the right hand end. The position of the carbon, it is explained, is such that it is kept

clean by the water rushing in when the stop cock is raised, the water and dirt thus leaving the filter by the tube immediately beneath the stop cock. To filter the water the stop cock remains closed, and the water is forced through the carbon and out of the other tube. Should the pressure be insufficient to keep the carbon washed clean, it may be removed and the surface cleaned with sand paper. The advantage claimed for the filter is that the filtering surface is easily kept clean, consequently the water is not forced through accumulated filth collected on the filtering surface.

The Matchless Coffee Pot.

Hill & Whitney Mfg. Company, 149 Pearl street, Boston, are offering a coffee pot as shown herewith. It is made with a filter which can be raised or lowered by means of a chain attached to it,

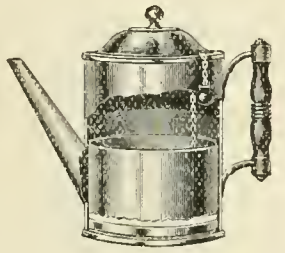


Fig. 1.—The Matchless Coffee Pot.

and which can be removed. For filtering, common unbleached cotton cloth is used, torn or cut in squares about an inch larger than the cylinder bottom, and secured on the bottom of the filter by means of a screw cap. In use the filter is placed at the bottom of the pot as in Fig. 1, into which fine ground coffee is put, and on which is poured the desired quantity of boiling water. After the pot has stood on the stove seven to ten minutes the filter is raised as in Fig. 2, and suspended by catching the hook on the chain over the rim of the pot. As soon as the liquid has passed from

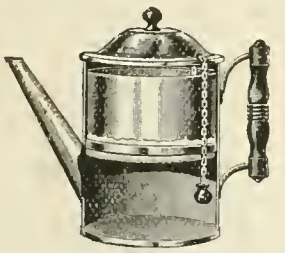
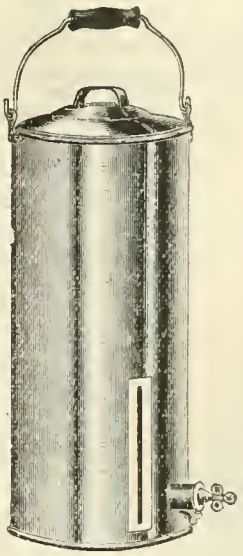


Fig. 2.—Filter in Coffee Pot Raised.

the filter, which requires two or three minutes, the coffee is considered ready for use. The advantages claimed for the process of first steeping and then filtering the coffee are as follows: That the grounds and water are quickly and perfectly combined and remain together steeping as long as is desired ; that in the use of a filter practically of as large an area as the pot a close texture of cloth can be used, permitting the use of fine ground coffee, resulting in economy of time and material and the production of a clear extract, and that by daily renewals of the filter at a cost of from $\frac{1}{2}$ to $\frac{1}{8}$ cent for each cloth, a uniform and excellent beverage is always obtained, free from all disagreeable taint. The manufacturers state that the pot is also especially adapted to making tea.

Maine Creamery Can.

Portland Tinware Company, Portland, Maine, are offering the creamery can shown here. It is referred to as being made of the best quality of tin, extra heavy, well made, and is provided with a glass gauge and metal faucet. The



Maine Creamery Can.

faucet is set 1 inch from the bottom, to allow the milk to be drawn off until the cream is reached, then to draw off the cream, leaving an inch of milk in the bottom of the can with the sediment undisturbed. The can has been put on the market to take the place of a high priced can.

Central Filter Cooler.

The Central Stamping Company, 23–25 Cliff street, New York, are offering the Central filter cooler, as shown in Figs. 1 and 2. Fig. 1 represents the filter in position. Fig. 2 shows the filter cylinder detached. The cylinders are made of galvanized iron and fitted with a carbon block filter, so arranged as to be easily removed for cleaning.

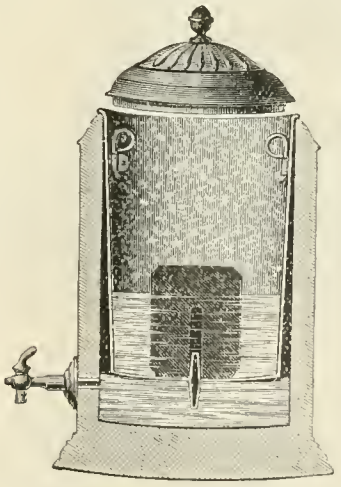


Fig. 1.—Sectional View of Cooler, Showing Filter in Position.

The ice and water are put into the cylinder, filtering through the carbon and tube into the cooler, to be drawn off through the faucet at will. The prominence given to purer drinking water by specialists of late years as a means of avoiding disease has stimulated the production of many forms of filtering apparatus more or less expensive. The filter here shown has been devised to

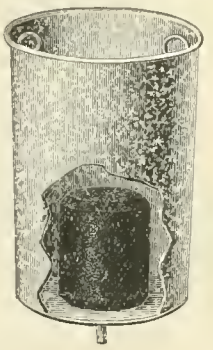
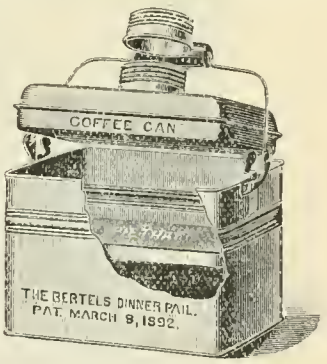


Fig. 2.—Showing Filter Detached.

accomplish the result sought at comparatively slight expense. The cylinders are made in seven sizes, from 2 to 14 gallons capacity, and will fit any of this company's regular coolers.

Screw Cup Dinner Pail.

The accompanying cut represents a dinner pail with a screw cup offered by W. B. Bertels, Son & Co., 186 East Market street, Wilkes-Barre Pa. The opening at the top of the coffee can is large enough to admit of the hand for easy cleaning, and the manufacturers claim that the coffee cannot leak or slop out when the cup is screwed on. The ears are provided with springs for holding the coffee can in place. The manu-



Screw Cup Dinner Pail.

facturers state that the material and workmanship are good, that the design of the pail is attractive, and that the coffee can is large. The pails are made in three sizes : small, medium and large.

Buckeye Pruning Shear.

The Peck, Stow & Wilcox Company, 27 Chambers street, New York, have improved their French pattern pruning shear by substituting a volute for the coil spring. The volute spring is made of a spiral scroll of steel plate extended in the direction of the axis of the coil, in which direction its elastic force is extended. The company claim for this method quickness and ease of action, while the combination of spring and shape of frame permits the shear to open sufficiently wide to take in a large stick without cramping or tight action when the blades are closed. It is especially adapted to grape culture and florists' uses. This shear is made in one size, 9 inches long, and will be known as Buckeye No. 99. They still make as heretofore the three sizes of the French pattern with coil springs.

ROOFING AND CORNICE.

Elaborate Sheet Copper Work.

The illustrations shown herewith represent, Fig. 1 front elevation, Fig. 2 side elevation and Fig. 3 plan view of a dormer in the shop, corresponding to the bevel of the mansard roof. The cheeks or sides of the dormer are of copper, and were riveted to the dormer at the building after the dormer was set and the roof slated. The roof of the dormer dered on the outside was first wiped clean with a damp rag to remove the acid, then dried. When dry the entire dormer was coated with linseed oil by means of a woolen rag soaked with oil. After this was dry the outside soldered

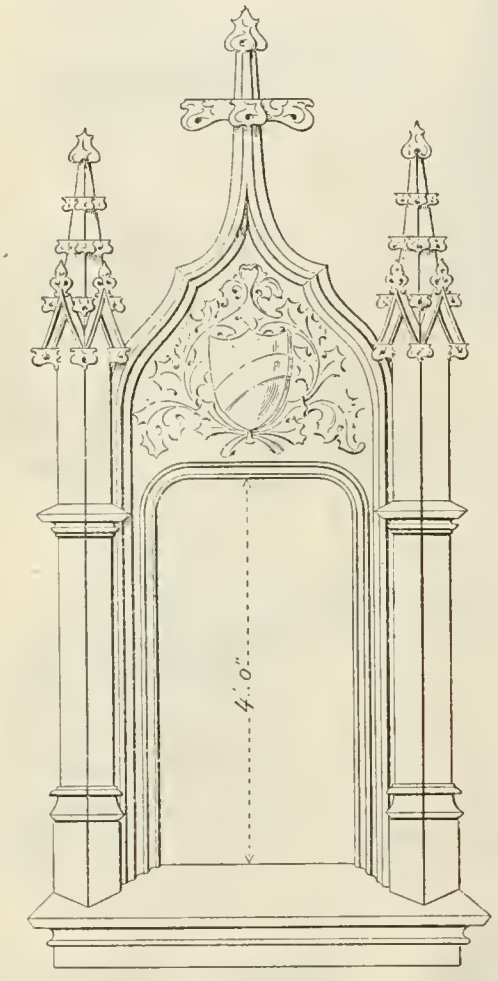


Fig. 1.—Front Elevation of Dormer Window

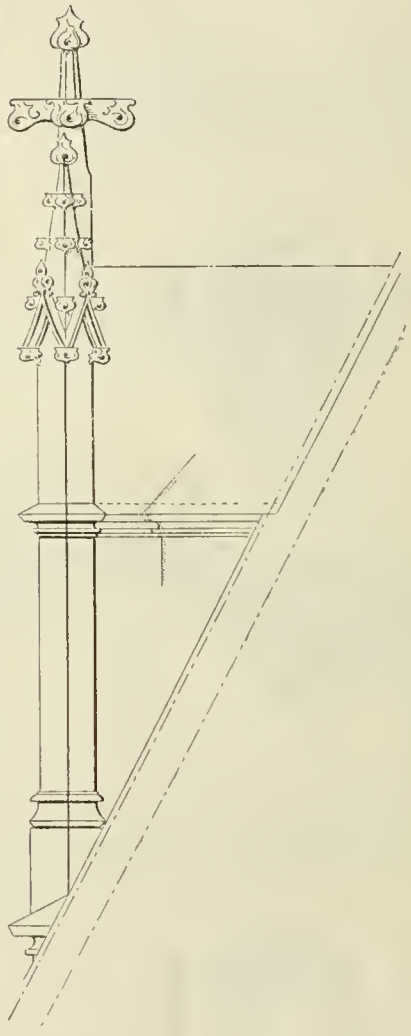


Fig. 2.—Side Elevation.

dormer window made of 20-ounce cold rolled copper. The round corners shown at the upper part of the window openings, likewise the moldings at the top of the dormer, were entirely hammered by hand, raising or stretching the blanks as was required. The center ornament was stamped with background complete and riveted to the flange made on the curved moldings for that purpose and soldered on the inside. The center finial was stamped in parts, soldered together and attached to the hammered work below the crockets. The side pilasters were formed in separate parts, riveted to the copper work, as shown in front elevation, after which the pinnacles were placed in position. In constructing the pinnacles the square pyramids shown on each side in front elevation were first formed and then attached to the square shafts below, after which the small crockets and gables were soldered in their proper positions. The return molding, shown in the side elevation, Fig. 2, was soldered to the

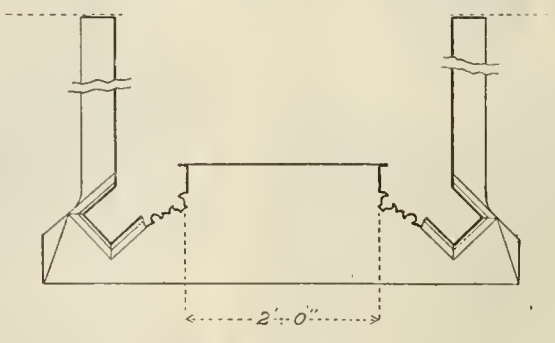


Fig. 3.—Plan.

ELABORATE SHEET COPPER WORK.

is covered with slate. All the joints and seams, where possible, were soldered on the inside, so as to show a clean surface. All other work which had to be sol- parts were bronzed with copper bronze of the same shade as the sheet copper, which gives a clean finish. The hight of the finished dormer measures 10 feet

9 inches from bottom of sill to top of finial. This copper work was made in the shop of J. Foerster & Son, 806 Fifth street, New York.

A Chat on Copper Roofing.

In a conversation with J. Flanagen, 396 Fourth avenue, New York, he made the following observations on copper roofing:

The roofing and, in fact, all of the sheet iron and copper work of the new Criminal Court Building, New York, was put on by my men. The steep part of the roof was covered with copper Spanish tile, and the flat portion with 18-ounce sheet copper, put on in the ordinary manner, one sheet at a time, like tin roofing. The sheathing on which it was laid was well seasoned, dry 1⅛ inch planking supported by rafters that were sufficiently close together to make the roof firm, so that when the seams were beaten down with a mallet the whole building did not shake. The sheets were 14 x 20 in size, notched and edged in a regular roofing brake.

They were laid with cleats, the nails used being of the drive screw character, tinned. In soldering about 8 pounds of solder were used to the square. Such a roof is worth about 25 cents a square foot, and when put on in this way it is not only calculated to last an indefinite time, but in case it should be taken off for any reason the old roof will bring enough money when sold to a junk dealer to pay for a new tin roof. Another advantage is that it never needs painting. The roof has now been on the building for over a year, and no difficulty has been experienced from expansion and contraction. The roof of the City Hall was put on about 50 years ago, and was put on in the standing seam style, and shows to-day in perfectly good condition, and has never had a coat of paint. If the people knew the advantages that follow the use of copper for roofing, it is probable that more would be used. Its use for covering public buildings is growing, and as architects and builders become more experienced with it, those who can afford to pay the price will specify it to be used on buildings in which they invest their money.

FLASHINGS.

J. Flanagen, 396 Fourth avenue, New York, is furnishing the galvanized iron work and copper front for the annex to Grammar School No. 25, at 104th street and Amsterdam avenue. The gothic windows at the top of the building will be covered with slate, while the roof will be of Meurer triple coated IX tin.

Schwing & Co., 190 Ferry street, Newark, N. J., make a specialty of architectural sheet iron work. They are making 24 large skylights for the Celluloid Company of Newark and furnishing skylights, sheet metal front and cornices for the new opera house at Elizabeth, N. J. They are making a new cornice for the store of A. F. Leicht, at Jersey City, N. J., and cornices and skylights for a school at Franklin, N. J.

"Total Eclipse" is the curious title of a little pamphlet of which we have recently received a copy. Further inspection shows that it relates to the Eclipse gutter beading and forming machine made by the Eclipse Machine Company of Troy, N. Y. Illustrations are given of the machine and testimonial letters are presented.

The Phœnix Plumbing Company, Phœnix, Ariz., have completed a large sheet iron front for the new business block being erected by Dr. Mahoney, adjoining the post office.

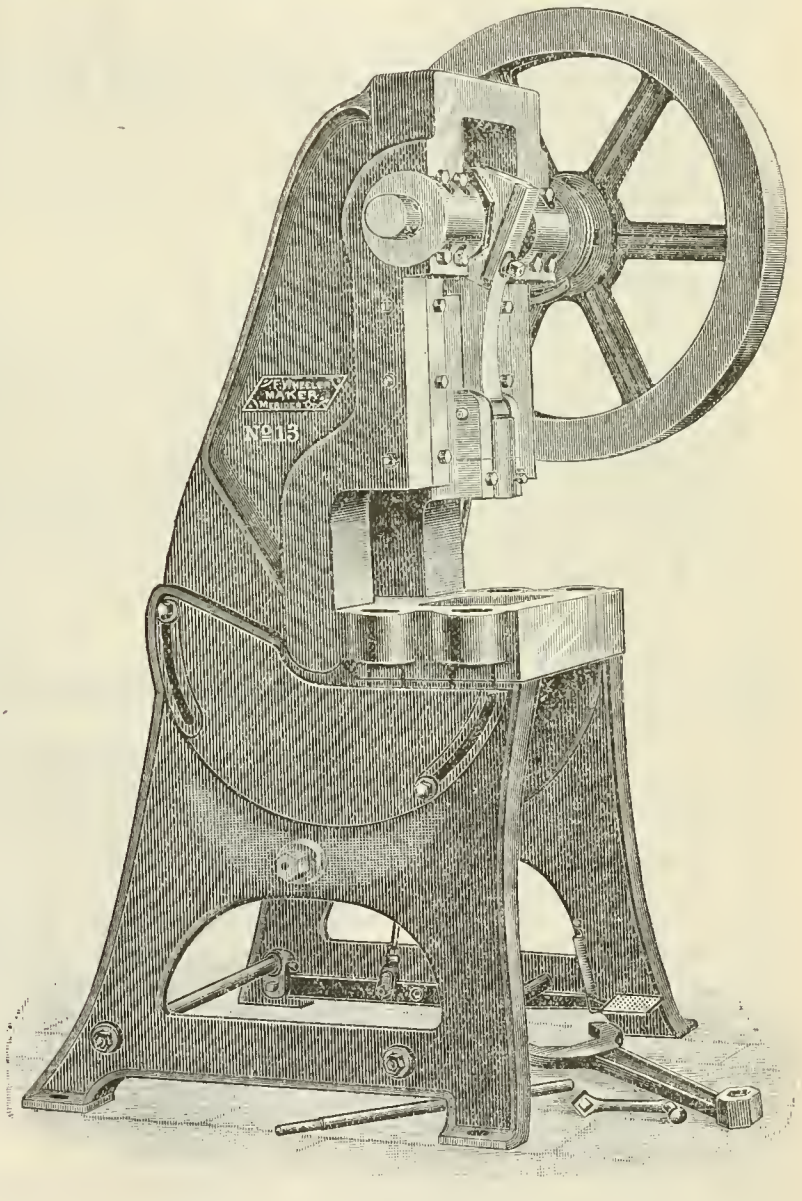
J. C. McFarland, 2511 to 2519 State street, Chicago, is to furnish the copper cornice, gutters, flashings, terra cotta cresting and 110 squares of Spanish tile roof for the residence of Philip Armour, Jr., Michigan avenue and Forty-seventh street.

The Wheeler Press.

This press, built by Frank Wheeler of Meriden, Conn., is provided with an incline adjustment, consisting of a sliding box placed on top of the pitman. The solid pitman is so arranged that all the strain and pressure come upon solid metal, the lower end of the pitman being seated in the solid metal of the slide or gate, and not resting upon a screw or pin. For adjusting the punch to the die it is simply necessary to turn a screw after loosening the clamping nut, when the box can be moved up or down the incline to the desired position.

The pressure at the time when the press is doing its heaviest work is brought squarely upon the end of the pitman, thereby relieving the adjusting screw and clamping nut from all strain and obviating the tendency to slip or strip the thread of the screw.

The machine is provided with a double clutch, which makes two points of contact simultaneously on opposite sides of and in and near the center of the press shaft. This does away with the cramping and twisting tendencies usual in clutches where the contact is made at only one point. By means of an automatic brake the press is stopped gradually and easily, there being no jolt or jar. The grate is so constructed as to take up all wear automatically and is provided with a self oiling device. The machine has a positive "stop up," which is simple in construction and automatic in operation.



The Wheeler Press.

Canadian trade returns for the nine months ended March 31 show a slight decrease in both exports and imports. Exports were $89,506,306, or $41,000 less than in the corresponding period of last year, while the imports were $86,197 918, or $825,022 less. The duty collected for the period exhibits a falling off of $500,000.

PLUMBING and GAS FITTING.

The Chicago Plumbers' Settlement.

The new agreement made by the Chicago master plumbers and the journeymen on the 25th ult. is practically the same as that which was in force for the previous two years. The rate of wages is to remain at $3.75 a day of eight hours. From June 15 to September 15 the hours of work Saturday will be from 8 a.m. to 12 m., for which the journeymen are to receive $2.25. Overtime is to be computed at one and one-half times the rate for regular time, except Sundays, national holidays and time after midnight, which is to be counted at twice regular time. Journeymen working outside the city will have their board and railroad tickets furnished, and when traveling at night will have a sleeper furnished when the distance is more than 100 miles. Time when traveling is to be computed as if the men were at work, except that single time will be allowed for Sunday and no charge made for traveling at night. The journeymen's association agrees to use all honorable means to make good any careless or incompetent work of any of its members.

All differences arising between employers and employees are to be settled by a committee of arbitration selected from the members of the association. No strike can be declared without first submitting the grievance to arbitration. Rules governing apprentices will be adopted by a joint committee selected from the two associations, which shall make its report before September 15, 1895. The new agreement is to remain in force until March 1, 1896.

Venetian Bath with Patent Folding Needle Bath.

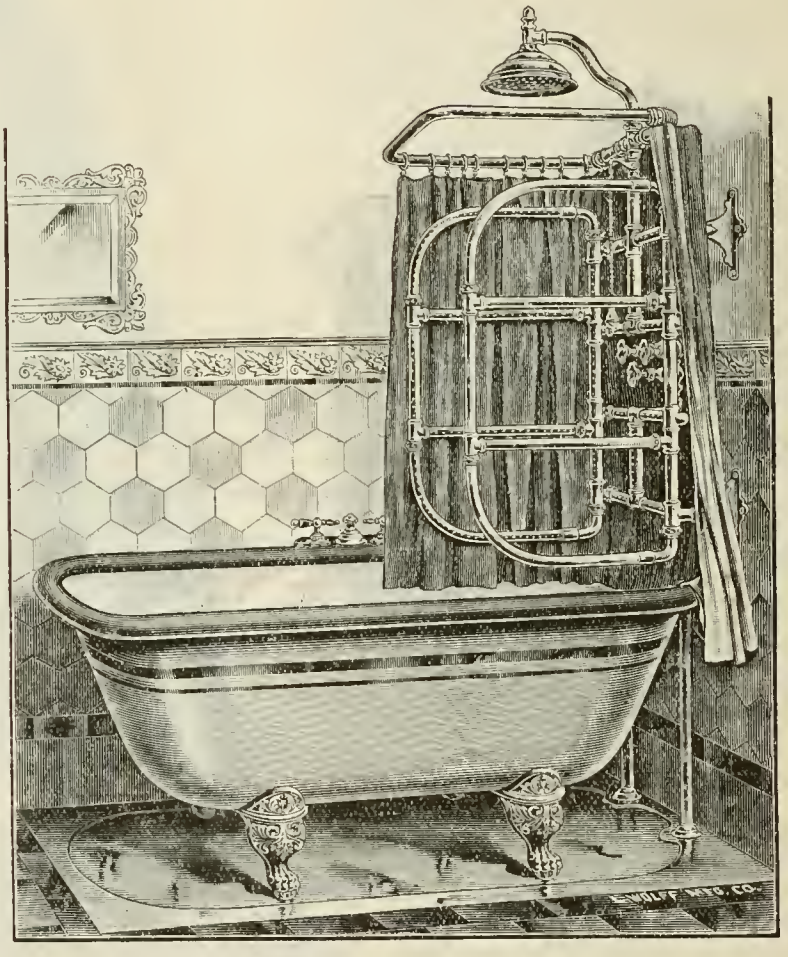
The L. Wolff Mfg. Company, 93 West Lake street, Chicago, have brought out a new and decidedly original arrangement for the bathroom, which is illustrated in the accompanying cut. The tub is highly ornate, being a white enameled iron Venetian bath, finished in zinc, white outside with two gold bands, all polished and nickel plated, Fuller double faucet with connection for bottom supply, supply pipes to floor, all polished and nickel plated Ideal waste, a 3 x 2-inch cherry roll rim rabbeted to fit the flange of the tub, legs of ornamental design, 19 inches inside depth, 26 inches inside width and in two lengths, 5 feet 5 inches and 5 feet 11 inches outside measurement. The tub is fitted with a needle and shower bath, so constructed that it can be folded together when not in use, and is adapted equally well for Turkish baths, athletic clubs, &c., or the private bathroom. When folded it requires but 9 inches of space, this being the projection from the wall, and therefore it can be used in the smallest bathroom.

When placed over a bathtub and folded it leaves the tub entirely free for the bather's use. This needle bath is strongly made and carefully put together and is of handsome design. The shower and needle bath or the bathtub fixtures can be operated separately or together as desired, each being governed by its own valves.

The Smoke Test.

The following is an account of a smoke test made by Boyd & Schnaier, 347 Columbus avenue, New York, in the residence of R. A. Myres, 59 East Ninety-second street, and which, in view of the attention now being attracted by this kind of test, will be read with interest. The building in which the test was made was a dwelling of four stories and a basement in which the plumbing system has been in use for seven or eight years. There were three soil pipes coming through the roof, and the back air pipes from the fixtures were connected with these pipes above the highest fixtures and below the roof. One was at the back of the house and the other two at the sides of the house, nearly opposite, near the center.

The test was made from the roof, as the fresh air inlet at the street was inaccessible. A hose led from the machine used for the test to the soil pipe, where it came through the roof and entered the open end, and the space around the hose was closed by packing with waste or oakum. The smoke chamber of the machine was charged with tarred paper, such as is used often in roofing, and in order to make a dense and penetrating smoke some waste that had been saturated with turpentine and also some sulphur was put in. The charge was lighted at the bottom, the chamber covered and the machine operated, which pumped in a continual current of air at the base of the charge which generated the smoke and forced it out through the hose into the plumbing system. As the smoke was driven down through this line of pipe it finally reached the horizontal pipe in the cellar and from the branches into it finally made its appearance through each of the other two openings on the roof. The other openings were then closed with a wad of oakum and the machine operated gently while a search was made through the house for leaks.



Venetian Bath with Patent Folding Needle Bath.

The first discovered was in an old fashioned bell trap placed in the cellar floor to carry off the water that might be used when the cellar was washed. The cloud of smoke which came from this opening showed that the seal of this trap was broken, and on lifting off the cover and stopping the opening with a wad of paper, the trap was

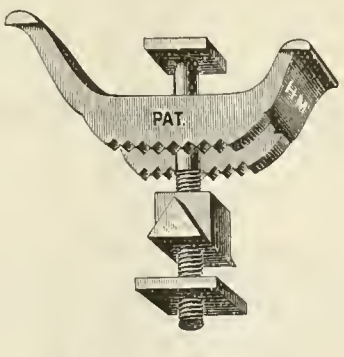
found to be perfectly dry and filled with dust, clearly showing that for over a year this trap has been ineffective and that sewer gases could freely enter the house. The next leak found was on the kitchen floor, in the back air pipe from the trap under the sink where it passed through the wainscoting. A nail had been driven in it and made a hole ⅛ inch in diameter through which gas could escape.

On the floor above, the back air pipe from the lavatory trap in one of the chambers was connected with a vertical branch joint, and in wiping this joint the plumber had not been careful to see that the under side was tinned. In consequence a tight joint had not been made, and had it been used for water the leak would have been readily seen. In appearance this joint was as good as any on the job, but the smell of smoke that filled the chamber and the smoke that puffed from the leak showed clearly where it was located and every movement of the machine on the roof was shown by a little puff of smoke through the opening in the joint. Another leak was found in the water closet on the third floor. This evidently was caused by the soil pipe settling. The leak, instead of being the usual vertical split in the pipe, caused by careless calking, was due to a break extending around it, just where the pipe proper connects with the hub. Though a candle was used to examine the crack, it was so fine that it was difficult to see it, yet the smoke puffed from it promptly with every stroke of the machine on the roof. The cause of some of the leaks in this section of the city in old houses may be due to the fact that rock underlies the ground, and in digging the cellars for new buildings the rock is blasted out, jarring the whole nighborhood. While this test was being made a severe shock was felt in the building as the result of a blast going off about half a block away.

THE STAR COUPLER COMPANY, St. Louis, Mo., report a heavy demand for their Star water back and boiler couplers. They are at present running night and day in their efforts to keep abreast of their orders. They recently received an interesting letter from Geo. M. Clark & Co., Chicago, Ill., who subjected the coupler to 250 pounds test and found it worked perfectly, and as the result of this test they are duplicating their orders. The Star Coupler Company received the contract for the new Planters' House, St. Louis. The couplers were specified and will be used for connecting 250 gas grates and logs. The Dawson Bros. grates of Chicago, Ill., will be used.

The Mueller Basin Clamp.

The H. Mueller Mfg. Company of Decatur, Ill., are manufacturing a basin clamp of newly patented design, which is herewith illustrated. This clamp is adjustable, so that it will fit any thickness of flange on the bowl. The main body of the clamp has a long slot in the center through which the bolt passes, thereby allowing the longest possible range of adjustment lengthwise. For this reason it is not necessary that the bolt be placed at any certain distance from the flange of the bowl. The washer, being wedge shaped, will always adjust itself to form a square bearing for the nut. That part of the clamp which comes in contact with the washer is notched, so that the washer holds it firmly in place, thereby preventing it from slipping. All the goods manufactured by this company are branded "H. M.," and they will warrant anything they make.

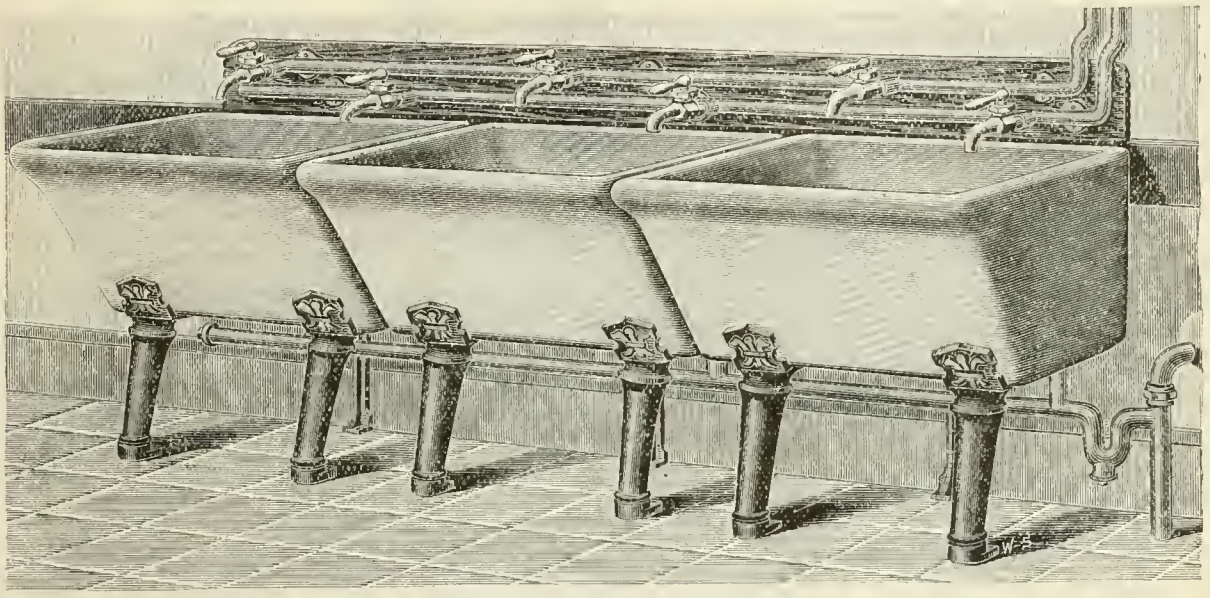


The Mueller Basin Clamp.

ROURKE & MCDONOUGH have retired from the plumbing business, at Knoxville, Tenn., and Kirk & Stout, two of their former employees, will succeed them. The firm of Rourke & McDonough, so long known in the plumbing business, will henceforth give their whole attention to the heating of buildings and to handling plumbing supplies.

Yorkshire Brown Glazed Laundry Tubs.

We show in the accompanying illustration the Yorkshire Brown Glazed Laundry Tubs, manufactured by Evens & Howard, St. Louis, Mo. A special feature of these tubs is that each one is made of a single piece of earthenware, hardened at a very high heat, and covered in and outside with a strong glaze of a rich dark brown color, which is said to be absolutely impervious to water, grease or acids. The corners are rounded, thus giving every facility for cleaning. They are finished with roll rims and supported by cast iron standards, as shown. The length, outside dimensions, of standard size, is 27½ inches; width, 22 inches; hight, 16 inches, and thickness, 1½ inches.



Yorkshire Brown Glazed Laundry Tubs.

TRAPS AND VENTS.

THE SHOW WINDOW of O'Brien & Lavelle, 162 East Twenty eighth street, New York, is arranged to attract the attention of all who pass. It shows on one side a lavatory fitted up with nickel pipes and trap, having a yellow sienna marble slab and a bowl decorated with flowers and gilt. On the other side they show a gilt decorated square top syphon jet water closet, connected with flush tank. In the center space is a porcelain lined cast iron bath, which is also decorated in gilt, resting on a Persian rug. The bottom of the window is covered with tile and a good idea is given of a model bathroom.

GEORGE M. FOSTER & CO. are a new house at 345 East Fifty-ninth street, New York, who make a specialty of plumbers' marble work, both for fixtures and wainscoting and flooring bathrooms or apartments.

THE L. WOLFF MFG. COMPANY, 93 West Lake street, Chicago, have just brought out their Supplement No. 1 to advance Catalogue B, in which they illustrate and describe Wolff's enameled iron baths. This is a 40-page cata-

logue, large quarto, filled with very choice engravings and exquisitely printed. A very great variety of enameled iron baths is shown, from rigidly plain ones to others of the most artistic finish in shape and decorations. Illustrations in colors are given in the catalogue of hand painted borders, which are used in decorating the more expensive bathtubs. The company are now producing an enamel which has proved very satisfactory. It makes a beautiful finish and is of a rich pure color. They enamel all their own goods. In addition to baths, the catalogue contains illustrations of Wolff's patent folding needle and shower baths; also bathroom fittings, such as nickel plated and brass towel racks, soap cup, tumbler holders, sponge holders, &c. Samples of the company's enameled goods and other plumbing specialties are on exhibition at their showrooms at 91 Dearborn street, Chicago; 1533 Blake street, Denver, and 11 North Washington avenue, Minneapolis. The last named branch has but recently been established, and is in charge of F. J. McArdle.

N. MEREDITH, Johnstown, N. Y., will move his plumbing shop from Church street to the store on South Perry street.

S. & A. CLARK, plumbers, are now in their new place of business at the corner of North Fourth and Prospect avenues, Mt. Vernon, N. Y.

CHAS. F. GEISSELE, 224 Ferry street, Newark, N. J., is one of the busy plumbers of that city.

AT A MEETING of the Master Plumbers' Association of Pittsburgh, held in the Builders' Exchange in that city on Tuesday, May 1, the following delegates were selected to attend the National Convention of the Master Plumbers' Association of the United States, to be held in Detroit, Mich., in June: R. J. Bradshaw, J. O. McGinniss, F. J. Gray, Joseph Rice, Frank McKnight, A. R. Tate, J. J. Cowling; alternates, William Collins, Samuel Harr, John Madde, Leo McShane.

DEMOCK, FINK & Co. are fitting up their showroom at 80 John street, New York, in a similar style to their showroom at 214 and 216 East 125th street. A row of water closets are set on Italian marble slabs against a wainscoting of Italian marble, with their flush tanks and nickel plated flush pipes connected with them all ready for use. The Primrose syphon jet has the place of honor, and is a handsomely decorated closet. The Orient and Melrose are front and back washout closets, representing the best productions in their line. These are followed by other closets of less pretensions in decoration. They also show a fine line of lavatories, the slabs being of Numidian, Verona, Italian and Knoxville marble and one handsome onyx. They are fitted with different styles of nickel plated fixtures and bowls in different styles of ornamentation. A handsome porcelain enameled bath is placed in the center of the floor, and white porcelain and brown Yorkshire laundry tubs are also conspicuously displayed.

THE INSTANTANEOUS WATER HEATING COMPANY, Chicago, have established an Eastern branch at 838 Broadway, New York, where they will carry a full line of Douglas and Acme heaters for heating water for domestic purposes. S. Bernstein, manager of the company in Chicago, has been in New York for the past month arranging for the Eastern branch. With him is E. Brownhill, who has been with the company in Chicago and who will be the Eastern manager.

G. M. SINCLAIR, plumbing inspector, Hoboken, N. J., reports a general improvement in the quality of plumbing work as conducted under the regulations of the sanitary code. He feels certain when the craft becomes thoroughly acquainted with the new condition of things and the rules more strictly adhered to, great good will result.

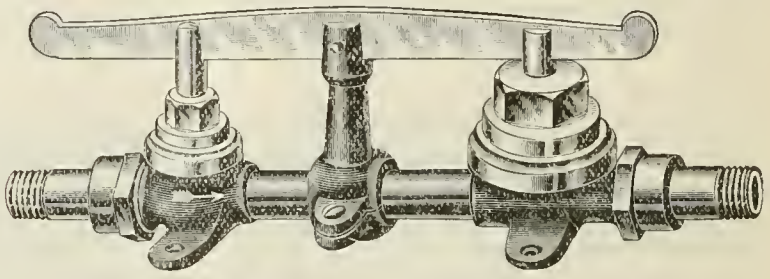
JOHN C. C. BOHLMAN & Co. have fitted up a building in the rear of the former's residence and fronting on Tyler street, Pittsfield, Mass., for their plumbing establishment, and are now ready for business.

ALCOCK PLUMBING COMPANY have been incorporated at Chicago, with a capital stock of $12.000. The incorporators are Joseph R. Alcock, Charles Alcock and W. J. Alcock.

SOME DISCUSSION is going on in the local papers of Hoboken, N. J., in reference to a new sanitary code that is being enforced. With the plumbers generally it is popular, as it is of the progressive character and modeled after the plumbing laws of New York City. On the other hand, as it makes some radical changes in the plumbing practice and requires a more expensive system than formerly, it is being sharply criticised.

Bennett's Water Pressure Regulator.

We show in the accompanying illustrations a general and a sectional view of Bennett's water pressure regulator, put on the market by the Bailey-Farrell Mfg. Company, Pittsburgh, Pa. Fig. 1 is a general view of the device, while Fig. 2 is a sectional view, showing its internal construction and its method of operation. The purpose of this device is to deliver water automatically from the street mains into the service pipes at any desired pressure, irrespective of the variations of the water pressure in the street mains. The regulator, it is said, responds quickly to the slightest fluctuation of initial pressure and maintains a constant, uniform pressure on the house service. It is placed on any convenient point on the water pipe supplying the house with the inlet end D, Fig. 2, at the street main. The water supply enters through D, K and E and exercises its pressure on the enlarged diaphragm J, communicating the water pressure from the house service pipe I through the scale beam A to shut off the pressure at the diaphragm K. The amount of pressure to be carried in the house service pipe at I can be adjusted by moving the fulcrum F to the right or left as desired. The device is spoken of as a simple, sensitive automatic regulator, having no wearing out parts except the rubber diaphragms J and K, which can be replaced as easily as an ordinary compression bibb can be repaired.



Bennett's Water Pressure Regulator.—Fig. 1.—General View of the Regulator.

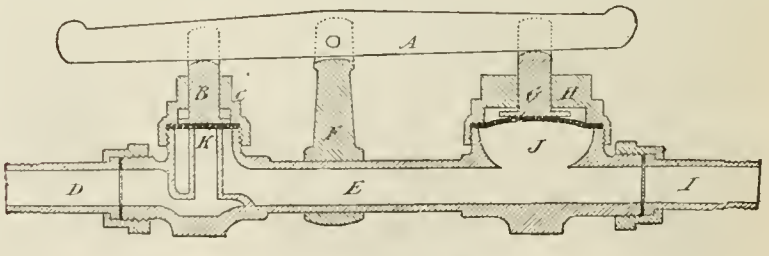


Fig. 2.—Sectional View.

The British Government allotment for reserve merchant cruisers, to be held at the government's disposal in case of war, is announced to be $162,500 for the present fiscal year. The companies subsidized are the Cunard for the "Campania" and "Etruria," the P. & O. for four large vessels of between 6000 and 7000 tons, the White Star for the "Teutonic" and "Majestic," and the Canadian Pacific for their three 6000-ton steamers, the "Empress of Japan," "Empress of China," and "Empress of India." In addition, the Cunard Company hold in readiness three vessels, the "Umbria," "Aurania," and "Servia," the White Star, the "Germanic," "Britannic" and "Adriatic" and the P. & O., 10 vessels of about 5000 tons each. Thus the Government pays for 12 steamers and gets 16 free.

The London *Economist* finds that a decided revival of business has begun in England. Although prices have declined 5 per cent., the values of exports are about on a par with those of last year, which they exceed in amount. Labor is more fully employed than at this season a year ago, the number of manufacturing establishments in operation is increasing, and reports from the chief industrial centers indicate a more hopeful feeling. Railway receipts, too, for the first quarter of 1894 were over 3 per cent. larger than those of the March quarter in 1893.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THE J. F. PEASE FURNACE COMPANY, Syracuse, N. Y., have been awarded the contract for the heating plant and the water closets and urinals for the Franklin School Building, at Bethlehem. The Demorest system of water closets, manufactured by the J. L. Mott Iron Works of New York, will be used.

JOHN A. SCOLLAY, 74 and 76 Myrtle avenue, Brooklyn, N. Y., has been awarded the contract for installing a hot water heating plant in the residence of J. H. O'Neil, Surrogate of Hudson County, at Jersey City, N. J.

THE A. HARVEY'S SONS MFG. COMPANY, Detroit, Mich., have been awarded a contract amounting to about $150,000 by the Economy Light, Heat & Power Company of Scranton, Pa., for the erection of a central plant and laying mains through that city for furnishing heat and power to customers. It is to be in operation by September 15.

C. H. GREEN, plumber, on Wyandotte street, South Bethlehem, Pa., has received the contract for doing all the sanitary and plumbing work at the new residence of Instructor Biggin of Lehigh University, on Broad street, West Bethlehem.

MRS. COLEMAN-STUCKERT is to build a co-operative house in Hyde Park, Ill., which will cover an entire block and cost $200,000. It will have electric light, steam heat and a system of plumbing.

MCDONALD & Co., 296 Sixth avenue, New York, are engaged in installing the plumbing system in the new annex to the Buckingham Hotel, Fifth avenue, New York. They are also about finishing the work in the Home Life Insurance Building and the Bowery Savings Bank, New York.

ARCHITECTS BROMPTON & LAWSON, Chicago, have prepared plans for a three-story apartment building, to be erected at 1322 Sheffield avenue for A. Allender. Galvanized iron work front; heating not decided.

ARCHITECT W. J. VAN KUREN, Chicago, has designed for J. E. Decker a three-story apartment house, to be erected on Park avenue, near Grove street, in Austin, Ill. Steam heat is to be used.

ARCHITECTS KIRKPATRICK & COLLINS, Chicago, have planned for George Blume, at Lawndale avenue, near Eighteenth street, a two-story flat building, to be heated by steam; for Mrs. H. F. Wallace, at 1181 Wilcox avenue, a two-story residence, to be heated with a furnace; for J. D. Rowe, at Wilcox avenue and Forty-fourth street, two cottages, to be heated by furnaces.

ARCHITECT F. NEWELL, Chicago, has prepared plans for the People's Institute, to be built on West Van Buren and Leavitt streets, with pressed brick and terra cotta front, tile and copper roof, cement and metal work, &c.

ARCHITECT L. G. HALLBERG, Chicago, has designed for George A. Stevens ten two-story houses, to be built at Clifton and Greenwood avenues. Warm air furnaces are to be used for heating.

ARCHITECT JULIUS HUBER, Chicago, has designed for Charles Steinbrecher a five-story apartment house, to be erected at Milwaukee avenue and Union street. It will be heated by steam and will be equipped with all modern improvements.

ARCHITECTS WORTHMAN & NEEBE, Chicago, have drawn plans for a three-story flat building, to be erected at Twelfth street, near Ogden avenue, for Mrs. Catherine Armstrong, to have all modern improvements, including galvanized iron work.

SMITH & WEBSTER, 15 to 21 North Clinton street, Chicago, are to furnish 50 No. 9 S. & W. porcelain baths, lavatories, &c., for the Holmes Hotel, Minneapolis. W. W. Sykes & Co. of the latter city do the plumbing work.

FOSTER & GLIDDEN, agents for the Farquhar Heating Company, 53 Dearborn street, Chicago, have the contract for placing a No. 28 Panama warm air heater in the residence of J. C. Triger, Blue Island, Ill.

THE BAKER & SMITH COMPANY, 193 to 197 Van Buren street, Chicago, are to furnish two tubular boilers and the necessary radiation for steam heating in the Kentucky School of Medicine, Louisville, Ky.

ARCHITECTS STILES & STONE, Chicago, have designed for J. Marshall a double residence, to be built at Fifty-fourth street, between Jefferson and Washington avenues, to be heated by hot water. The same architects have planned for Nicholas Hunt a three-story apartment house to be built on Monroe avenue, between Fifty-seventh and Fifty-eighth streets.

BLAKE & WILLIAMS, 197 Wooster street, New York, are engaged in installing a heating plant in a school at Forty-sixth street and Sixth avenue. The contract amounts to $26,000, and will include a combination of the blower and exhaust systems with both direct and indirect radiation. They are also installing a heating plant in the addition to the New York City Building for the Insane, at Central Islip, L. I. This contract amounts to $36,000, and a feature of this system is that the extreme radiation is placed over half a mile from the boiler. The water is returned from the system to a tank and is pumped into the boiler. They are also engaged in installing a heating plant in the new government building at West Point, N. Y. This contract amounts to $30,000.

F. E. GRIMSHAW, East Hampton, L. I., has the contract for the plumbing in a new residence to be erected on the Dunes near the ocean by H. A. James of New York City. The water is brought across from Georgica Pond more than 1000 feet by an air motor mounted on a steel tower 40 feet high which operates a pump. O. H. Northrop, well known in western Connecticut, has the work in charge.

ALBERT A. CRVER & Co., 85 Centre street, New York, has been awarded the contract by Capt. Thomas McManus for heating an apartment house on Fifth avenue, in which a No. 320 ten-section steam heater will be used, and a No. 55 Victor steam heater will be used in an apartment house he is erecting at the corner of 115th street and Fifth avenue for the same contractor. They will also install a No. 55 Victor steam heater in the apartment house being erected by Rudolph Guggenheimer, at 101st street, New York.

G. M. SINCLAIR, 106 Fourth street, Hoboken, N. J., is doing the plumbing, heating and electric lighting in the new Fire Department headquarters of that town. A conspicuous feature of the plumbing is the nickel plated piping and faucets, making a very attractive appearance. The heating is by hot water, a Perfect boiler, made by the American Boiler Company, being employed for the purpose. The contract amounts to $2700.

DAVIS, WRIGHT & Co. of Keene, N. H., have the contract for placing a No. 55 Victor steam heater in the dwelling owned by George O. Hayward of Keene, N. H. They have also the contract for heating the block remodeled and owned by F. H. Wright & Co., in which they will use a No. 320 seven-section Richmond heater.

E. H. RANDALL & Co., Concord, N. H., have a number of heating contracts on hand, among which is the contract to heat the house owned by L. R. Wood of Bradford, Vt., in which they will place a No. 418 Richmond steam heater.

SANDS & REGAN, 54 Fifth avenue, Chicago, have the contract for plumbing, sewerage and gas fitting in the residence of A. Leonard, 6026 Wharton avenue.

THE S. WILKS MFG. COMPANY, 113 to 123 Clinton street, Chicago, have received orders for four large water heaters for the new officers' quarters at Fort Riley, Kan.; four 16 x 36 inch self feeding water heaters with automatic damper regulators for the Plattsburg Barracks, Plattsburg, N. Y.; one large water heater and tank for the Y. M. C. A., Cumberland, Md., and one water heater for the Y. M. C. A. new building, Memphis, Tenn. Since the settlement of the local strike city orders are coming in freely.

SCRAP.

THE LOCKOUT in a number of Welsh tin plate works against the 36 box rule still continues, without any sign of yielding on the part either of the employers or the employed.

THE STATISTICAL STATEMENT of imports and exports issued by the Treasury Department for the month of March, 1894, illustrates clearly the marked falling off in tin plate receipts during the present fiscal year. Under the head of "Tin plates, terne plates, and tagger's tin," the imports for the month of March are shown to have been 39,968,992 pounds of the value of $1,055,124, against 55,084.059 and $1.525,878 respectively in March of last year. For the nine months ended March 31 in each year the quantities imported were as follows: 1894, 333,643,743 pounds; 1893, 420,279,313 pounds, and the values were for 1894, $8,938,428; for 1893, $11,830,401.

IN A HANDSOME industrial edition, lately issued, the *Keystone Gazette* of Bellefonte, Pa., suggests that the large nail works of that town, which are for sale, would be admirably adapted for a tin plate works.

N. & G. TAYLOR COMPANY, Philadelphia, have just supplied their Old Style brand of extra heavy coated roofing tin tor covering the State Library and Executive building at Harrisburg, Pa. The same brand is also used on the House of Representatives. Messrs. Taylor Company report an excellent and steady demand for all their product, and say their works in Philadelphia are fully employed not only on terne plate, but also on bright tin plate of all kinds.

STEAM AND HOT WATER.

Arrangement of Air Ducts.

BY HELIOS.

Fig. 1 shows indirect radiation with tile cold air duct under the cellar floor and with mixing valve and register in side wall. The cold air pipe is made of sewer pipe and is carried under the cellar floor out through the wall and up to grade, same as shown in a previous article. Great care must be taken in laying this pipe to have all the joints cemented perfectly water and air tight. All the cold air pipe above the cellar floor is galvanized iron.

Fig. 2 shows indirect radiation with tile cold air duct under the cellar floor, without mixing valve, with register in the floor.

Fig. 3 shows arrangement of indirect radiation taking the air from the room that the hot air is discharged into. This arrangement is used in basement houses where the room is on the same level with the boiler and the customer does not want to place a coil or radiator on the side wall of the room that is to be warmed.

Fig. 4 shows arrangement of indirect radiation the same as in Fig. 3, with cold air supply taken from outside the building, having the cold air pipe under the basement floor.

Fig. 5 shows side elevation of indirect radiation, with hot and cold air connections, mixing valve and cold air duct and hot air pipes in the wall of the building. This arrangement is used in schools or other large buildings where there are large numbers of indirect radiators supplied from one cold air duct. The cold air duct is built of brick, the wall of the building being used for one side of the duct.

Fig. 6 shows elevation of indirect

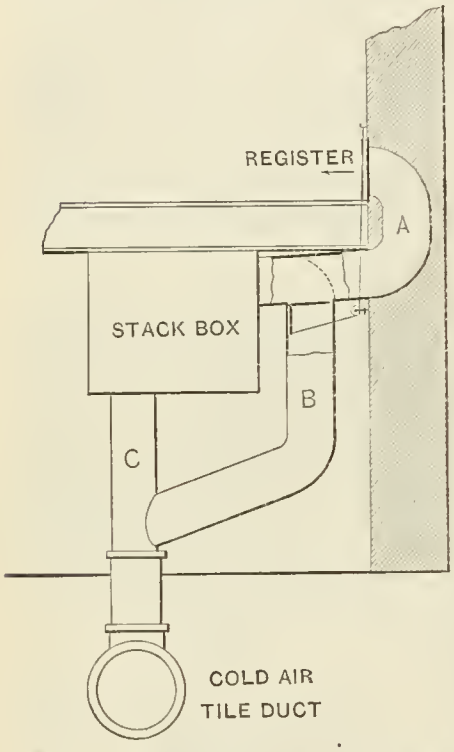


Fig. 1.—Indirect Radiator with Side Wall Register.

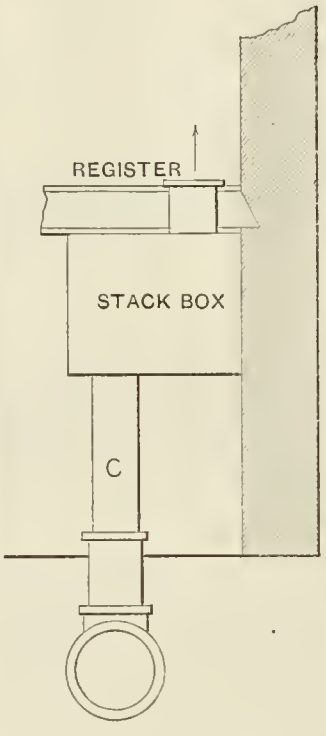


Fig. 2.—Indirect Radiator with Floor Register.

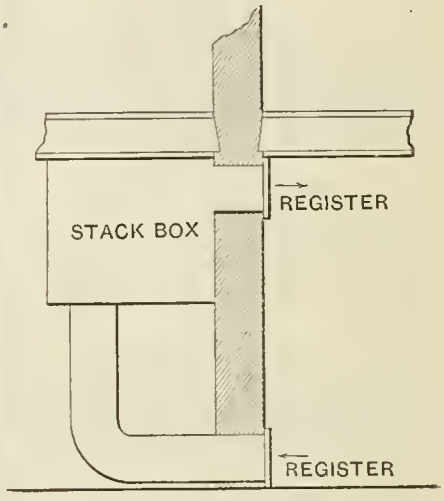


Fig. 3.—Indirect Radiator Circulating Air in Room.

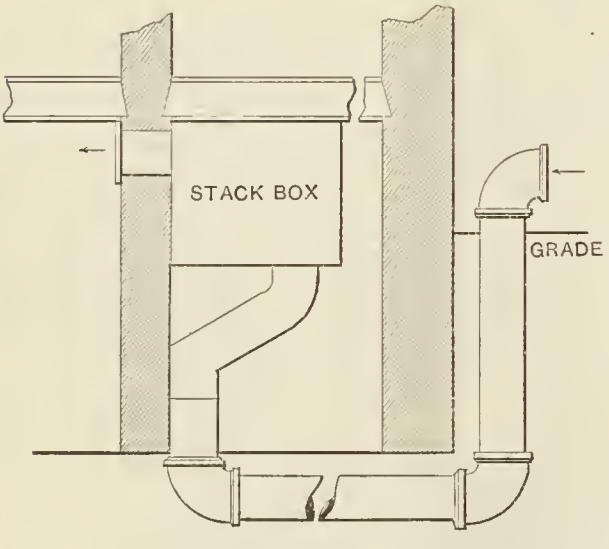


Fig. 4.—Indirect Radiator with Register Near Ceiling.

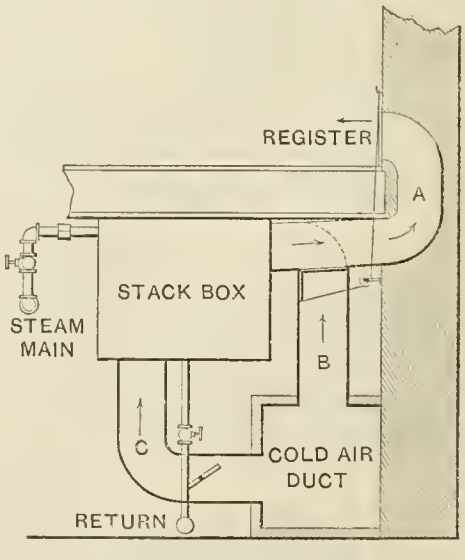


Fig. 5.—Indirect Radiator Used in Large Buildings.

ARRANGEMENT OF AIR DUCTS.

radiation connected to three floors of a building with the hot air pipes placed close together in the wall. The connecting pipes from the radiators to pipe in the wall and discharge of hot air into the rooms to be the same as shown in Fig. 5. C is the cold air pipe to radiators and B is the cold air pipe to mixing valve.

Fig. 7 is a plan of which the elevation is shown in Fig. 6. A, A, A are the hot air pipes in the walls to the first, second and third floors. B, B, B are the cold air pipes from cold air duct to mixing valve. C, C, C show where the cold air pipe is connected to the under side of stack box. The indirect radiators are placed out in the basement about 3 feet from the side wall. This is done to allow for connections to the mixing valves and for hot air pipe connections from the stack boxes. The chains from the mixing valves are run up in the hot air pipe to the room with which the radiation is connected.

Fig. 8 shows an arrangement of indirect radiation where the air is taken from the same room that is warmed. This arrangement is used in stores where there is no room for direct radiation and in halls of churches and schools for foot warmers. It is also very often used in dwellings in place of direct radiators.

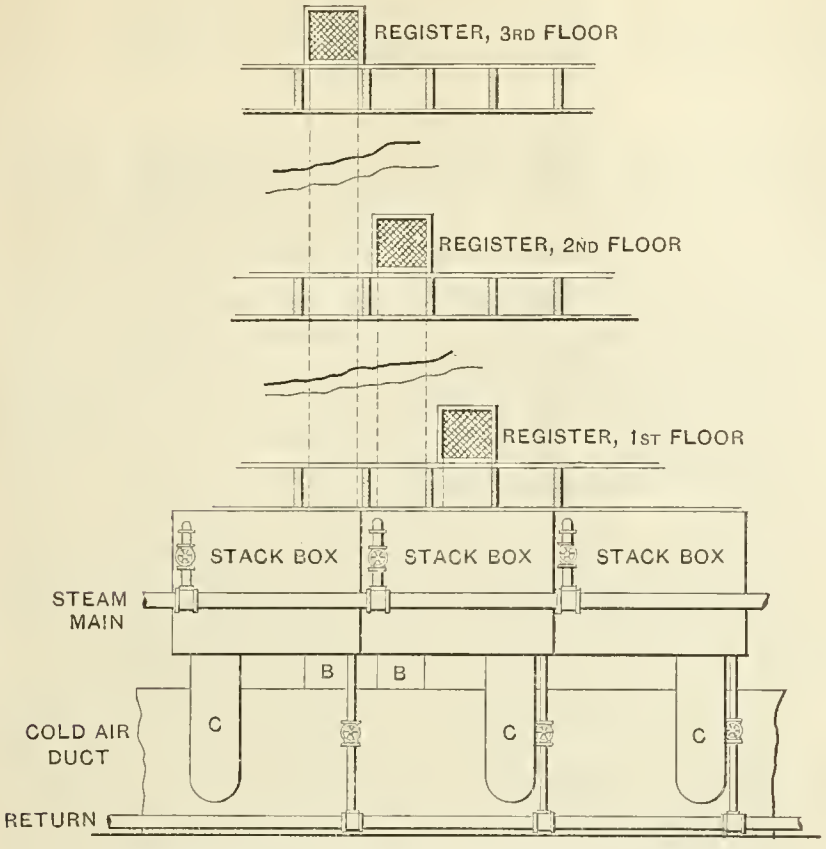


Fig. 6.—Elevation of Indirect Radiators and Registers.

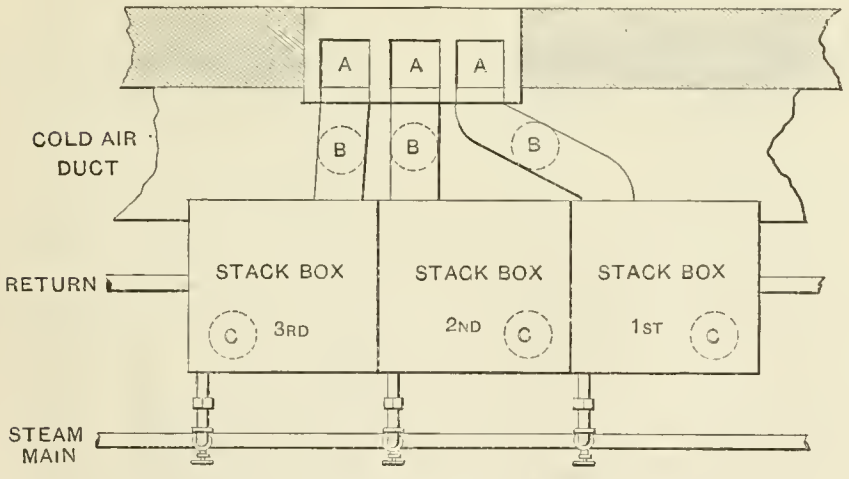


Fig. 7.—Plan of Indirect Radiators and Pipes.

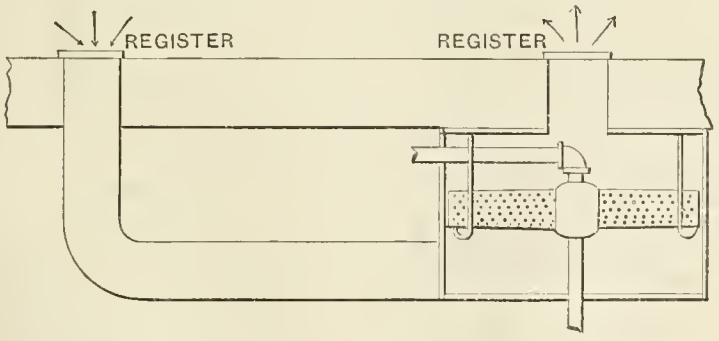


Fig. 8.—Indirect Radiator Drawing Air from Building.

ARRANGEMENT OF AIR DUCTS.

HEATING NOTES.

THE J. L. MOTT IRON WORKS, 84 Beekman street, New York, publish small illustrated circulars particularly devoted to the Sunray heaters. One of the circulars presents a general view of Mott's new Sunray steam heater, together with description and table of sizes and prices. The second circular gives a broken view of Mott's Sunray water heater, and also shows it in connection with a horizontal boiler.

THE A. A. GRIFFING IRON COMPANY, 34 Dearborn street, Chicago, have secured the Western agency of the Gurney hot water heaters, and will carry a full stock of them.

THE ALBANY STEAM TRAP COMPANY, Albany, N. Y., are doing a thriving business, making all kinds of specialties used in connection with steam power. The concern manufacture automatic steam pumps, valves, steam traps, governors, and every device required by users of steam.

HENRY HOUGHTELING, previously with the Gurney Hot Water Heater Company, has accepted the position of traveling salesman for the A. A. Griffing Iron Company, 34 Dearborn street, Chicago.

W. R. HARMOUNT, Detroit, Mich., whose name is familar to the steam and hot water heating trade, has just returned from Europe after a nine months' visit, which was spent in the joint pursuit of business and recreation. Mr. Harmount is much benefited by his outing and is well prepared to again enter into active business.

GEO. E. ADAMS & CO, Glens Falls, N. Y., are well pleased with the hot water heating plant which they placed in the Rockwell House in that city. It has been in every way a success.

W. B. TUFTS, 96 John street, New York, finds an increasing interest in the heating trades for iron pipes and fittings, of which he carries a varied line in addition to other steam and water supplies.

THE MAIN OFFICE of E. F. Keating has been removed to the warehouse and machine shop at 452 Water street, New York. Here he carries a line of everything required by the water or steam fitter, and is prepared to cut pipe to specification. An office is still maintained for the convenience of the trade at 75 John street.

RUBEL & BROTHERS have moved their factory from 209-211 South Clinton street to 114 116 East Lake street, Chicago, Ill.

STOVE TRADE NOTES.

THE TWENTY-THIRD Annual Stove Convention

WEDNESDAY.

The annual convention of the National Association of Stove Manufacturers met in the Banquet Hall of the Auditorium Hotel, Chicago, on Wednesday, the 2d inst.

Members Present.

The following is a list of members present at the meeting:

Barbour, Geo. H., the Michigan Stove Company, Detroit, Mich.
Bell, Joseph, Joseph Bell Stove & Range Company, Muncie, Ind.
Bennett, H. W., Indianapolis Stove Company, Indianapolis, Ind.
Boal, Stanhope, Favorite Stove & Range Company, Piqua, Ohio.
Bowditch, Edward, Rathbone, Sard & Co., Albany, N. Y.
Brasfield, G. M., Wooldridge Stove Company, Memphis, Tenn.
Brisland, James, Home Stove Works, Chicago.
Brooke, J., Floyd, Wells & Co., Royersford, Pa.
Burt, N. H., Great Western Stove Works, Leavenworth, Kan.
Buttorff, H. W., Phillips & Buttorff Mfg. Company, Nashville, Tenn.
Castle, C. H., Comstock Castle Stove Company, Quincy, Ill.
Collins, F. W., the Cortland-Howe Ventilating Stove Company, Cortland, N. Y.
Cribben, Henry, Cribben, Sexton & Co., Chicago, Ill.
Cribben, Wm. H., Cribben, Sexton & Co., Chicago.
Culter, R. A., Culter & Proctor Stove Company, Peoria, Ill.
Dana, Geo. D., Excelsior Mfg. Company, St. Louis, Mo.
DuCharme, C. A., the Michigan Stove Company, Detroit, Mich.
Duffy, Jas., Duffy Trowbridge Stove Company, Hannibal, Mo.
Dugdale, Joseph T., Western Stove Mfg. Company, St. Louis, Mo.
Dwyer, James, Peninsular Stove Company, Detroit, Mich.
Dwyer, Jeremiah, the Michigan Stove Company, Detroit, Mich
Dwyer, John M., Peninsular Stove Company, Detroit, Mich.
Emery, J. W., Channon-Emery Stove Company, Quincy, Ill.
Emery, S. H., Jr., Channon Emery Stove Company, Quincy, Ill.
Gardner, Fred. W., the Michigan Stove Company, Chicago, Ill.
Goldschmidt, Julius, Brand Stove Company, Milwaukee, Wis.
Graff, H. L., Graff & Co., Pittsburgh, Pa.
Hanrahan, E. C., Peninsular Stove Company, Chicago, Ill.
Hayes, H. E., Bloomington Stove Company, Bloomington, Ill.
Hunter, John E., Culter & Proctor Stove Company, Peoria, Ill.
Kahn, Lazard, F. & L. Kahn & Bros., Hamilton, Ohio.
Kernan, Francis, Syracuse Stove Works, Syracuse, N. Y.
Lee, Fred. E., Beckwith Estate, Dowagiac, Mich.
Leonard, J. J., Toledo Stove Company, Toledo, Ohio.
Lounsbury, James A., Collins & Burgie Company, Chicago, Ill.
Miller, Theo., Art Stove Company, Detroit, Mich.
Moffatt, Albert, Collins & Burgie Company, Chicago, Ill.
Montgomery, J. F., Taunton Iron Works, Taunton, Mass.
Moore, Lewis, Joliet Stove Works, Joliet, Ill.
Moore, W. N., Joliet Stove Works, Joliet, Ill.
Mott, A. C., Abram Cox Stove Company, Philadelphia, Pa.
Mott, Ed. P., Abram Cox Stove Company, Chicago, Ill.
Orr, J. Allison, Mt. Penn Stove Works, Reading, Pa.
Patton, A. G., Patton Mfg. Company, Columbus, Ohio, and Jeffersonville, Ind.
Patton, W. D., Patton Mfg. Company, Jeffersonville, Ind.
Peck, E. W., Co-operative Foundry, Rochester, N. Y.
Perry, Nathan B., Perry Stove Company, Albany, N. Y.
Prizer, Chas. S., Orr, Painter & Co., Reading, Pa.
Pruden, A. K., St. Paul Stove Works, St. Paul, Minn.
Richardson, A. P., Richardson & Boynton Company, New York and Chicago.
Rogers, John, Home Stove Works, Chicago, Ill.
Ruso, James M., official stenographer, Albany, N. Y.
Ryley, A. G., H. Wetter Mfg. Company, Memphis, Tenn.
Sard, Grange, Rathbone, Sard & Co., Albany, N. Y.
Sard, Wm. H., Rathbone, Sard & Co., Chicago, Ill.
Scott, W. H., Sill Stove Works, Rochester, N. Y.
Seivard, H., Mt. Penn Stove Works, Reading, Pa.
Staufer, W. M., Buckwalter Stove Company, Royersford, Pa.
Stevenson, W. S., Thomas, Roberts, Stevenson Company, Philadelphia, Pa.
Thomas, D. M., secretary N. A. S. M., Chicago, Ill.
Thompson, Geo., Enterprise Stove Company, Vincennes, Ind.
Trowbridge, C. H., Duffy-Trowbridge Stove Company, Hannibal, Mo.
Van Cleave, J. W., Buck's Stove & Range Company, St. Louis, Mo.
Van Evera, De Witt, Brand Stove Company, Milwaukee, Wis.
Van Wormer, J., J. Van Wormer & Co., Albany, N. Y.
Venn, James A., Rathbone, Sard & Co., Aurora, Ill.
Viets, H. A., Fuller-Warren Company, Milwaukee, Wis.
Warren, Walter P., Fuller & Warren Company, Troy, N. Y.
Wells, I. H., Collins & Burgie Company, Chicago, Ill.
Wewers, Wm., Gem City Stove Mfg. Company, Quincy, Ill.
Will, Fred., Sill Stove Works, Rochester, N. Y.
Woodruff, J. M., J. Woodruff & Sons, Salem, Ohio.

The session was opened at 10.30 a.m. by President George D. Dana of St. Louis, who made an address in accordance with the usual custom, outlining the events of the year. Secretary D. M. Thomas also presented his official report of the work of the association, together with recommendations for the action of the convention.

A paper was then presented by the Fuller-Warren Company on "The Interchange of Information and Experience Between Stove Manufacturers," which was discussed at some length.

The afternoon session was opened by the reading of a paper on "Cleaning Castings," by Abram C. Mott. Next followed a paper by Henry Cribben on "The Education and Production of Efficient Workmen." Mr. Cribben's paper was so well received that a sufficient number of copies for every molder and apprentice in the country was ordered to be printed.

The Committee on the Secretary's Report submitted the following preamble and resolution, which were adopted as the sense of the convention:

The large decrease in the demand for stoves during the existing business depression, the decreased output and the maintenance by manufacturers of the same scale of wages heretofore paid have materially increased the cost of production.

The selling prices of stoves already so nearly approach the cost of producing and marketing them that any reduction of prices must result in serious demoralization and disaster.

The best interests of manufacturers, of dealers and of labor obviously require the exercise of a wise and confident conservatism through rigid adherence to existing prices and terms, therefore

Resolved by the National Association of stove manufacturers, that current prices and terms on stoves be firmly maintained during the year 1894.

The convention then adjourned until 10 o'clock on Thursday morning, after a session which was pronounced to be one of the most interesting and instructive ever held in the history of the association.

THURSDAY.

(*By Telegraph.*)

Only one session of the association was held on Thursday, and it was opened by the reading of a paper by J. Leon Gobeille of Cleveland, Ohio, on "A Theory of Ornamental Design as Applied to the Decoration of Stoves." The paper was an explication of the Newtonian theory that sound, color and form are all interconvertible and harmonious. It was illustrated with a large number of diagrams, Mr. Gobeille

presenting in colors the music of a hymn and then, by playing on a piano and violin, showing the principles deduced from the colors. The paper was listened to with deep interest and a vote of thanks was given the author at the close.

Charles S. Prizer of Reading, Pa., next read a paper on "Profit Sharing," which evoked considerable discussion. We shall make further note of the papers read at the convention in a later issue. After the reading of the papers the meeting proceeded to the election of officers for the ensuing year, the result being as follows:

President, George D. Dana, St. Louis.

First vice-president, Lazard Kahn, Hamilton, Ohio.

Second vice-president, Francis Kernan, Utica, N. Y.

Treasurer, W. S. Stevenson, Philadelphia.

Secretary, D. M. Thomas, 80 Broadway, New York.

Board of Management, H. W. Buttorff, Nashville, Tenn.; Henry Cribben, Chicago; C. A. DuCharme, Detroit; Frederick Will, Rochester, N. Y., and W. E. Walker, Taunton, Mass.

An assessment for expenses was then made, the same as last year, and Chicago was selected as the place for the next meeting. A discussion of the "Cost System" was then taken up, after which the convention closed its twenty-third annual session by adjournment.

Eavesdroppings.

— On Tuesday evening a number of the stove manufacturers accepted an invitation extended through George H. Barbour to visit the residence of James W. Ellsworth, on Michigan avenue. Mr. Ellsworth is one of the great coal operators of the country, but is perhaps better known as an art connoisseur and collector of curios. The gentlemen composing the party, in addition to Mr. Barbour, were Messrs. Nathan B. Perry, W. S. Stevenson, Jeremiah Dwyer, George D Dana, C. A. Du Charme, Grange Sard, Wm. H. Sard, A. C. Mott, C. H. Castle, E. W. Peck, Frederick Will, J. W. Vau Cleave, Edward Bowditch, Frederic W. Gardner, Alan W. Wood and a representative of *The Metal Worker*. They were received and warmly welcomed by Mr. Ellsworth, who took great pleasure in escorting his visitors through his spacious mansion and exhibiting the art treasures collected from all parts of the world. He has a superb art gallery, hung with paintings by the great masters, among which is one of Rembrandt's most famous works. Hours were spent most agreeably in the inspection of these as well as rare productions in bronze, old china, and artistic work of every description, including priceless treasures in ancient and modern books.

— As one of the visitors walked over a rug eight centuries old, a wicked associate vows that he remarked, "This rug is no older than I feel."

— Secretary Thomas is a sufferer from muscular rheumatism, which manifested itself particularly in his right hand, rendering it awkward on such an occasion as this, when greeting so many friends. He was the recipient of universal sympathy, and is now probably in possession of more remedies for and preventives of rheumatism than he had dreamed were in existence.

— The widespread publication a few days before the meeting of the convention that the smallpox had made its appearance in Chicago created consternation in the ranks of the stove men. Telegrams poured in on the local manufacturers inquiring the extent of the reported epidemic, and they had much trouble in satisfying the inquirers that it would be entirely safe for them to sojourn in the city for two or three days. One report in circulation was that the inspectors of the Board of Health were meeting every train on its entrance into Chicago for the purpose of vaccinating the passengers who could not show evidence of their having recently undergone that operation. The fear of being exposed to contagion in Chicago was at last allayed, but for a few days the chances seemed to be strongly in favor of the postponement of the time of meeting or the designation of some other city. The truth is that while smallpox has broken out in a few sections of the city it is by no means epidemic, and such vigorous efforts are being put forth by the health authorities to confine it to these localities that there seems to be little danger of its affecting the general health of the city.

— The condition of the stove trade was an unfailing topic of conversation among the manufacturers. Not a few stated that their foundries had closed down or were about to do so, as their stock of stoves seemed more than sufficient to supply whatever demand might be experienced for a considerable time. The maintenance of prices came in for considerable discussion in this connection. The general feeling appeared to be strongly in favor of keeping prices up to the old standard instead of trying to force business by making reductions. The argument was made that no greater number of stoves would be purchased even if consumers were offered inducements in the way of lower prices, while, on the other hand, there was a strong probability that the condition of demoralization that would inevitably ensue would result in an attempt to reduce wages and thus cause much friction and unpleasantness, which should be avoided if possible.

— The number of stove supply houses represented at the convention was smaller than in previous years. Some very familiar faces were missing which had beamed on stove conventions from time immemorial. The hard times and the paring of margins through excessive competition have undoubtedly had their effect on the stove supply trade, and this year's appropriations for stove convention expenses were either cut down or cut off.

— The Ireland & Matthews Mfg. Company of Detroit, Mich., had a representative on hand in the person of the genial C. H. Matthews, who made a fine display of top ornaments in one of the Auditorium parlors. The company manufacture hundreds of designs, but exhibited on this occasion a choice selection of the finest. The ancient statuette has now completely disappeared, and in its stead is a creation of filigree work, scrolls and curved bands, usually surrounding a spherical center. Opportunity is thus given for a great variety of shapes, decorations and finishes. The Ireland & Matthews Company do their own spinning, plating, &c., having a factory completely equipped for the production of the finest work of this character, including chandeliers. A novelty they are introducing this year is a nickel steel edge for ranges to take the place of the old cast edge, which is liable to warp and crack. Their edge is shaped in dies to conform precisely to the range for which it is made. They also showed fine new tile effects, with tiles of convex shape, painted by hand in pleasing tints. In connection with this exhibit were shown new draft slides just brought out by H A. Matthews of Waterbury, Conn. The peculiarity of these slides is the attachment of the knob. Instead of being riveted, the knob is held in place by a strong spring which pulls an inside washer tight against the reverse of the slide so that it cannot become loose. The knob is thus easily put in place, but once in position cannot be removed without pushing the knob in. The Ireland & Matthews Company presented the members of the convention, as a souvenir, a very pretty Waterbury watch, inscribed on the back, "We watch your interests," together with the date and the company's name.

— The Matthews & Willard Mfg. Company of Waterbury, Conn., were represented by E. A. Ireland, who made a very handsome exhibit of the company's products, comprising top ornaments, knobs, onyx tables and lamps. The top ornaments presented a fine array of very choice designs. Combinations of ormolu and white nickel were conspicuous in a great variety of detail. Perhaps the richest ornaments shown were wholly of ormolu, enriched with scroll work and open work. The managers of this company take pride in their exclusive designs, and their customers this year have purchased more expensive and artistic ornaments than ever before, to meet the requirements of advancing taste among consumers. The company make onyx tables of exquisite finish, trimmed with brass, and a large line of lamps. Every part of the work is done in their own factory.

— A. D. Stone represented the Worcester Ferrule & Mfg. Company of Worcester, Mass., and displayed a great variety of samples of their stove trimmings, comprising door knobs, hinge pins, damper slide knobs, towel rack knobs, &c. The company have greatly simplified the methods of manufacturing knobs since they first engaged in the business and yet have not impaired the quality of the goods in any respect. These knobs are manufactured of steel, which is drawn in dies to the proper shape, then polished and afterward nickeled. Considering the number of processes through which they pass, they are sold to the trade at marvelously low prices. The company have recently added to their line the manufacture of ball bearing steel cups and joint ferrules for bicycles. The joint ferrules are drawn from one piece of steel and take the place of expensive drop forgings.

— J. E. Gaitley of the Troy Nickel Works, Troy, N. Y., was in attendance upon the convention, but made no display of the products of the works, probably believing that everybody was sufficiently acquainted with the merits of the world renowned Alaska cold handled goods.

— Another manufacturer who was on the ground but made no display was W. F. Greene, of Troy, N. Y., maker of the Jewel and Crown stove knobs.

The Defense Association.

The Stove Founders' National Defense Association held their annual meeting on Tuesday afternoon, May 1, in the Auditorium Hotel, Chicago. It was well attended, but the proceedings were of much less importance than last year. Then there were two important subjects up for consideration. One was the threatening attitude of the molders, who were apparently determined to force an advance in wages. A conflict seemed imminent, as the leaders among the workingmen thought that they were entitled to an advance by reason of the prosperity which had existed in the stove trade for the previous two or three years. They could not see anything to interfere with another prosperous season for the stovemen, and considered the times propitious for demanding an advance. A delegation of molders had been appointed to attend the meeting of the Defense Association and to present their case. It was a strong delegation and made an excellent impression on the assembled manufacturers, but the latter were wiser in their forecast of the future, as subsequent events proved, and would not grant the desired advance, although it was urged so forcefully by the representatives of the workingmen. It was an exciting time, and the prospects seemed ripe for a trial at arms between employers and employed, when the request of the latter was turned down by a practically unanimous vote of the members of the association. The other important subject was the election of a

secretary. An attempt had been made to work up a hostile feeling against the re-election of D. M. Thomas, the efficient secretary of the association. It was futile, and Mr. Thomas was retained in his position by a vote which showed that he had a strong hold on the esteem of the members, and the opposition amounted to nothing.

This year there were no questions of this kind coming up for settlement. The molders are not looking for an advance in such times as these. They are satisfied if they can get employment at the old rate of wages, instead of suffering a heavy reduction, such as has afflicted their fellow workmen in other branches. The president of the association, Henry Cribben, had no report of an approaching conflict to give his official address any spice. The proceedings were of a tame character. The old officers were re-elected. The only changes made were the appointment of James Dwyer, Detroit, on the committee for the Third District in place of E. S. Barbour of Detroit, who retired, and Julius Goldschmidt of Milwaukee on committee for the Fourth District to fill the vacancy caused by the death of Frederick G. Brand of Milwaukee.

The Philadelphia Stove Trade.

The outlook for the stove trade in Philadelphia is not a bright one. The actual business done since the first of the year shows a decrease of about one-third in volume as compared with the business for the corresponding period of 1893. Founders all agree that unless there is a change in the general business condition of the country before July the prospect for a good season's trade will be slight. Three days a week is about the average running time of foundries, which means a production of little over half what it should be. The present production, however, with the stock carried over from last season, will afford an ample supply for the near future. Warehouses are already filling up, so it is unlikely that the present rate of production will be increased, unless a change for the better is soon noticeable.

A member of one of the largest firms of manufacturers makes the statement that they could almost close down until July 1, and only find themselves short on a few common goods. It is true that stocks in retailers' hands are light, but hand to mouth buying still continues. They are aware of the fact that the consumer is alive to the practice of economy and is prolonging, as well as he is able, the life of an old stove, and this fact was fully demonstrated by the heavy repair business of last season. Should business revive, however, the trade will be heavy, and it is in this hope that production goes on.

Prices seem to be satisfactory and steady, and the cutting which prevails so largely in other lines is noticed but little in the stove trade. Manufacturers seem content to take business as it comes, orders as a rule being too small to entail much competition. The present low price of iron makes little material change in the cost of a stove, the difference in most cases being met by an increase in the weight of the castings. There will be several new lines of goods placed on the market this season, chiefly in the form of square heaters and sheet iron goods, but very few of the new introductions will be of the high priced variety.

The Philadelphia building trade during the month of April took out permits for the erection of 1133 buildings, only 42 less than the number of permits taken out during the same month last year. Building operations, however, in the main are not as good financially as they have been. Stoves and furnaces are expected to be put into new dwellings and equities taken in payment for them. This plan is very unsatisfactory to the stove trade and is attended with considerable risk, as the equities are mostly in the shape of second mortgages, and in the case of a depreciation in the value of property much loss is likely to result.

Jobbers and retailers have found the business in summer goods on the whole very satisfactory. The business was late in opening, but so far has been large.

Collections show little, if any, improvement. Statements seem to have no effect upon tardy customers, and drafts are returned in some cases without remark. It is many years since a like condition was noticeable. It is probably chiefly owing to the retailers' own difficulties in the way of making collections, but in some cases manufacturers feel that the prevailing dullness is being taken advantage of to force extensions of credit.

A noticeable feature in the trade is the cheerfulness which prevails. Although the present prospect is poor manufacturers are on the lookout for a change, and when it comes they will not be found unprepared to take advantage of it.

The Van Wie Gas Stove Works

of Rockford, Ill., have just issued a 30page catalogue of their productions. They are manufacturers of Eclipse and Gilt Edge gas stoves. The illustrations begin with the Eclipse range No. 105, all cast iron, which has five burners on top and two burners for the baking and roasting ovens below. The No. 106 Eclipse is the same construction, except that it has steel sides and back. Nos. 107 and 108 have a broiler on brackets at the side. Nos. 109 and 110 have a water heater in place of the high broiler. Nos. 111 and 112 have a low water heater, with a warming oven over it, arranged at the side of the stove. Nos. 113 and 114 have a broiler placed over the warming oven and low water heater, thus bringing that part of the stove flush with the top of the main part. The New Eclipse range No. 55 is 32 inches high, has two large ventilated ovens and five burners on top. The Nos. 1 and 2 Eclipse have four burners on top and baking and roasting ovens below. The Nos. 10 and 11 Eclipse have three burners on top. The Gilt Edge ranges are cheaper ranges, but the manufacturers say "cheap only in price." They are shown in three styles. Then follow portable stoves of one, two and three burners each, in a variety of styles: lodge stoves, with very large tops and three and four burners, but in portable style; laundry stoves, with steel frames and two or three burners; water heaters of several kinds, to be used independently or in connection with cooking apparatus; an instantaneous water heater of new design and low in price; griddle cake baker, sad iron heater, gas soldering furnace and a gasoline stringer for use in changing gasoline to gas stoves.

Cupola Management.*—XI.

BY DR. EDWARD KIRK.

Daubing.

After the cupola is chipped out the lining is repaired with a soft plastic adhesive material known as daubing, with which all the holes that have been burned in the lining are filled up and thin places covered, and the lining given the best possible shape for melting and dumping. There are a number of substances used for this purpose, some of which are very refractory, and others possess scarcely any refractory properties whatever and are not at all suitable for the purpose. Molding sand is frequently used for a daubing. It is easily and quickly wet up and mixed, is very plastic and easily put on, but possesses none of the properties whatever requisite to a good daubing. It crumbles and falls off as soon as dry in exposed places, and a lining cannot be shaped with it. Furthermore, when put on in places from which it is not dislodged in throwing in the stock it melts and runs down and retards the melting by making a thick slag that is readily chilled over the tuyeres by the cold blast.

Some of the yellow and blue clays are very adhesive and refractory and make good daubing alone or when mixed with a refractory sand. Ground soapstone and some of the soapstone clays from coal mines make excellent daubing. But probably the best and most extensively used daubing is that composed of fire clay and one of the silica sands known under various names in different sections of the country and which I shall designate sharp sand. Fire clay is very plastic and adhesive when wet, but shrinks and cracks when dried rapidly. Sharp sand alone possesses no plastic or adhesive properties whatever and expands when heated. When these two substances, in exactly the right proportions, are thoroughly mixed, they make a daubing that is very plastic and adhesive, does not crack in drying, neither expands nor shrinks to any extent when heated, and resists the action of heat as well as fire brick in a cupola. When not evenly mixed the fire clay cracks and the sand expands and falls out of the clay when heated, making an uneven and uncertain daubing.

Fire clay absorbs water very slowly and it requires from 12 to 24 hours' soaking before it becomes sufficiently soft to be thoroughly and evenly mixed

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with the sand. A large soaking tub should be provided near the cupola and it should be filled with clay every day after the cupola is made up and the clay covered with water and left to soak until the next heat. The clay and sand cannot be evenly mixed in a round tub with a shovel, so a long box and a good strong hoe should be provided for the purpose. The amount of sand a clay requires to make a good daubing varies from one-fourth to three-fourths, according to the qualities of the clay and sand, but generally one-half of each give good results. The sand is added to the clay dry, or nearly dry, and the daubing is made as thick and stiff as it can be applied to the lining and stick. The more it is worked in mixing the better, and if let lie in the mixing box for a day or two after mixing it makes a better daubing than if applied as soon as prepared.

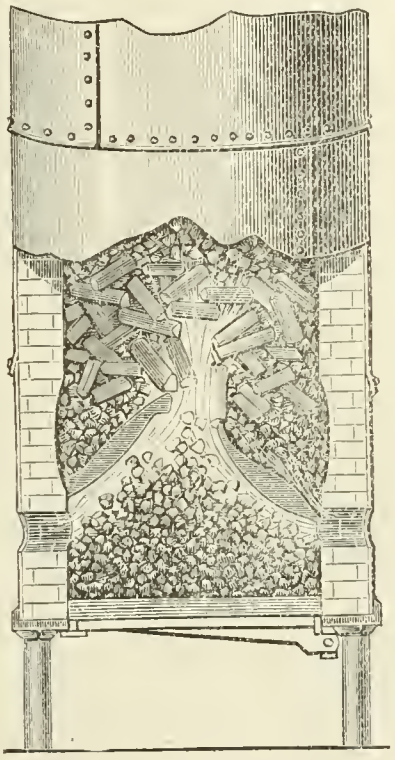
Nothing is gained by using a poor, cheap daubing, for it does not protect the brick lining, but falls off or melts into a thick tough slag which runs down and chills over the tuyeres and retards the melting by bunging up the cupola, and more fuel and time are required to run off the heat. The daubing is taken from the mixing box on a shovel when wanted for daubing and placed on a board under the cupola if the box is near at hand. When it is some distance from the cupola the daubing is placed in buckets or small boxes made for the purpose and conveyed to the cupola. The parts of the lining to be repaired are first brushed over with a wet brush to remove the dust and wet the lining so the daubing will stick better. The daubing is then thrown on to the lining with the hands in small handfuls; it can be made to penetrate the cracks and holes better in this way than in any other and stick better than when plastered on with a trowel. After the required amount has been thrown on in this way it is smoothed over with a trowel or wet brush and made as smooth as it can be made.

Shaping the Lining.

Daubing is applied to a lining for two purposes—viz., to protect the lining and to shape the cupola, and the latter is by far the most important of the two. A great many melters never pay any attention to it, their only aim being to keep up the lining, and they pride themselves on making a lining last for one, two or three years. Nothing is gained by making a lining last for years if the melting is retarded by doing so and enough fuel consumed and time and power wasted every month to pay for a new lining. Besides, a lining will last just as long when kept in a good shape for melting as when kept in a poor one, and the aim of the melter should be to put the lining in the best possible shape for melting and make it last as long as he can.

New linings are made straight from the bottom plate to the charging door when the cupola is not boshed. When it is boshed the cupola is made of a smaller diameter at and below the tuyeres, and the lining is sloped back to a larger diameter from about 6 inches above the tuyeres, with a long slope of 18 or 20 inches. In the straight cupola slag and cinder adhere to the lining just over the tuyeres every heat, and if not chipped off close to the brick after each heat gradually build out and in time a hard ledge forms that is difficult to remove. It furthermore reduces the melting capacity of the cupola by increasing the tendency to bridge. Above this point at the melting zone the lining burns away very rapidly and a hollow or belly is burned in it at this point every heat that requires repairing. Above the melting zone the lining burns away very slowly and evenly and seldom requires any repairing until it becomes so thin that it has to be replaced with a new one.

The cinder and slag that adhere to the lining just over the tuyeres must be chipped off close to the brick every heat and the lining made straight from the bottom plate to 6 inches above the top of the tuyeres. No projection or hump should ever be permitted to form or be made over the tuyeres to prevent iron running into the tuyeres of more than ½ or ¾ inch, and it should be placed right at the edge of the tuyere when it is thought necessary to make it. The upper edge of the tuyere lining should



Section through Bridged Cupola.

be made to project out a little further than the lower edge, and the brick lining should be cut away a little under each tuyere so that molten iron falling from the top of the tuyere will fall clear of the bottom side of the tuyere and not run into it.

It is not necessary or advisable to fill in the lining at the melting zone and make it perfectly straight, as it is when it is new, for a cupola melts better when bellied out at the melting zone. It must, however, be filled in to a sufficient extent for each heat to keep up the lining and prevent it being burned away to the casing. No sudden offsets or projections should be permitted to form or remain at the upper edge of the melting zone, for the stock lodges in settling upon projections and does not expand or spread out to fill a sudden offset, and so the heat passes up between the stock and lining and cuts away the lining very rapidly. No sudden offset or hollow should be permitted to form at the lower edge of the melting zone over the tuyeres, for the stock will lodge on it in settling and cause bridging of the cupola. The lining should be given a long taper from 6 inches above the tuyeres to the middle of the melting zone, and a reverse taper from there to the top of the melting zone. The belly in the lining should be made an oval shape, so the stock will expand and fill it as it settles from the top and not lodge at the bottom as it sinks down in melting. As the lining burns away above the melting zone the straight cupola assumes the shape of the boshed cupola, and only the lower taper is given to the melting zone.

Daubing should never be put on a lining more than 1 inch thick, except to fill up small holes, and even then small pieces of fire brick should be pressed into it to reduce the quantity of daubing and make it firmer. All clays dry slowly and give up their water of combination only when heated to a high temperature. When daubing is put on very thick it is only skin dried by the heat of the bed before the blast goes on. The intense heat created by the blast glazes the outside of the daubing before it is dried through to the lining, and as there is no way for the moisture to escape, it is forced back to the lining, where it is converted into steam and in escaping shatters the daubing or tears it loose from the lining at the top.

In the accompanying illustration is shown a sectional view of a cupola I saw at Richmond, Ind., in 1875. This cupola was a small one, about 35 inches diameter at the tuyeres, and the average heat was about 4 tons. The melter was a hard working German, who knew nothing about melting whatever, and his only aim was to keep up the lining in the cupola. With this object in view he would fill in the hollow formed in the lining every heat at the melting zone with a daubing of common yellow clay and make the lining straight from the tuyeres up. The daubing required to do this was from 2 to 4 inches thick all around the cupola, and was put on very wet. The heat dried and glazed this daubing on the outside before it was dried through. There being no way for the water to escape, it was converted into steam, and in escaping from behind the daubing tore it loose from the lining at the top. The fuel and stock in settling got down behind the daubing and pressed it out into the cupola from the lining until it formed a complete bridge, with only a small opening in the center through which the blast passed up into the stock. Before the heat was half over all the iron melted was running out at the tuyeres, and the bottom had to be dropped. When the cupola had cooled off the daubing and stock were found in the shape shown in the illustration, and when the bridge was broken down it was found to be composed entirely of daubing that had broken loose from the lining in a sheet and doubled over.

This melter always had slow melting and difficulty in dumping. Some nights after dumping he would work at the tuyeres with a bar until eight o'clock before he got a hole through, so the cupola would cool off by morning. The lining was not protected by the thick daubing, but was cut out more by the repeated bridging than if it had been properly coated with a thin daubing. I daubed this cupola properly and ran off two heats in it and melted the iron in less than half the time usually taken, and had no difficulty in dumping clean.

The lining of the boshed cupola does not burn out at the melting zone in the same shape nor to so great an extent as in the straight lined cupola, and in shaping the lining it is made almost straight from the top of the slope to the bosh up to the charging door. The

taper from the bosh to the lining should start at 6 inches above the top of the tuyeres, and should not be less than 18 or 20 inches long, and must be made smooth with a regular taper so the stock will not lodge on it in settling. Should the cupola be a small one with a thick lining and only slightly boshed and burn out at the melting zone similar to the straight cupola, it must be made up in the same way as the straight cupola. The great trouble with boshed cupolas is that the melter does not give a proper slope to the taper from the bosh, but permits a hollow to form in the lining over the tuyeres, in which the stock lodges in settling and causes bridging out over the tuyeres.

These directions for shaping the lining only apply to the common straight and boshed cupolas. Many of the patent and odd shaped cupolas require special directions for shaping and keeping up the lining as it burns out, and every manufacturer of such cupolas should furnish a framed blue print or other drawing, to be hung up near the cupola, showing the shape of the lining when new and the shape it should be put in as it burns away and becomes thin. Full printed directions should be given for chipping out and shaping the lining. All the improvements in cupolas are based on the arrangement of the tuyeres and shape of the lining, and when the lining gets out of shape the working of the tuyeres is disarranged, and the cupola is neither an improved one nor an old style, and is generally worse than either. More of the improved cupolas have been condemned and thrown out for want of drawings showing the shape of the lining and directions for keeping it up than for any other cause.

Early Stove Advertising Poetry.

The following letter from the Cleveland Co-operative Stove Company of Cleveland, Ohio, will doubtless be read with interest by many members of the trade:

The recent almost tragic death abroad of the well known writer, Miss Constance Fennimore Woolson, calls to mind the fact that probably her first literary efforts were in connection with the stove manufacturing business. Mr. Woolson, the father of the celebrated writer, was really the pioneer in the stove manufacturing business in the West. He established himself in a small way in the then village of Cleveland, and met with success. At the time of his death the firm of Woolson, Hitchcock & Carter were among the leading stove manufacturers of the country. After the death of Mr. Woolson and Mr. Carter, one of his partners, the concern was merged into the Franklin Stove Works, who later were succeeded by the present Cleveland Co-operative Stove Company. Almost the initial stove of Mr. Woolson's production was known as the Morning Star, which had a very large sale, and in the advertising of thia the first literary efforts of the poetess, then a mere child, were exerted. There were some eight or ten stanzas, which were printed and used by the trade as an advertising medium for the sale of the stove. Among the archives of the old concern have been found only three stanzas, reading as follows:

The Moruing Star is all the rage,
Because it suits in every age.
The people come both near and far,
Just to buy the Morning Star.

It suits the farmer's wife, they say,
Because it bakes well every day.
It suits the townsman just as good,
Because it burns so little wood.

If you'd have peace, comfort and bliss,
And at home enjoy each cherished wish,
And shun the rocks and clear the bar,
Then fail not to buy the Morniug Star.

A part of the third line of the last stanza quoted is not legible and may not be entirely accurate. Perhaps some of the older stove dealers can supply the missing verses.

ODD PLATES.

The mammoth counterpart of a nickel plated Garland range which formed the distinguishing feature of the exhibit of the Michigan Stove Company at the World's Columbian Exposition, has recently been placed in an elevated and prominent position in the area fronting the works of the company on Jefferson avenue, Detroit.

The many friends of E. S. Barbour, president of the Detroit Stove Works, will be interested in learning that his suit against the Wabash Railroad Company for damages on account of injurtes received by an accident in a train near Crown Point in May, 1892, has been decided in his favor. The jury were out but a short time and brought in a verdict awarding Mr. Barbour $5000. After the announcement of the verdict the counsel for the defendants stated that an appeal would be taken to the higher courts.

The Monroe Foundry & Furnace Company of Monroe, Mich., have sent us a very attractive catalogue relating to the Floral City furnaces, which they manufacture in several varieties. The volume is made up of about 100 pages of letterpress, printed in tinted ink upon good paper and bound in attractively ornamented colored paper covers. The aim of the concern in issuing this publication has been not to enter into an extended discussion of scientific heating and ventilation, but rather to present a few general laws which experience has shown to be practical, and invite a careful investigation of the conspicuous merits embodied in the Floral City furnace. The early pages contain remarks on warming and ventilation, followed by a description of the goods named. Scattered through the volume are half-tone engravings of buildings, public and private, in connection with which the company's goods have been used. Numerous tables are also presented, giving the dimensions and heating capacity of the Floral City furnaces; also capacity of pipes and registers. The latter portion of the volume is given up to extracts of testimonial letters, as well as to a long list of some of the persons using and dealing in the company's goods. The makers state that they have during the past ten years made a special study of the heating and ventilation of churches, school houses and other public buildings, and are prepared to give satisfaction in every case. In addition to the warm air furnaces the company offer the trade a line of combination warm air and hot water heaters, reference to which is made in the pages of the catalogue.

According to dispatches to the daily press from Mansfield, Ohio, the most severe wind and rain storm experienced in years passed over that section on the evening of Saturday, April 28. Reports from neighboring towns are to the effect that much damage was done to buildings, trees and fences, and that in Mansfield many structures were unroofed, among them being the Eclipse Stove Works.

Anson Ingraham, one of the oldeat and best known citizens of Washington County, N.Y., died at his home in Center Cambridge, April 21. He was born in Pittstown, Rensselaer County, N.Y., in 1811. He went to Center Cambridge 62 years ago and established a general store. His business grew rapidly and he branched out in several enterprises, one being the manufacture of stoves at Troy. Later he became the senior member of the firm of A. Ingraham & Co.

Last week some interesting experimeents with a straw burning cook stove were made in Minneapolis, Minn. The stove is the invention of D. R. Hoopes, is constructed of sheet steel, and the upper portion does not differ essentially from that of the ordinary coal burning stove. Two fuel doors open from the front, and are intended for the insertion of large cartridges in which the straw, hay, corn cobs or stalks are placed. In general appearance the cartridges must resemble an exaggerated shot gun shell, except that in place of the cap is a small round hole which is used as an upper draft through the shell. On one side of the cartridge is a 3-inch draft, which extends the entire length—27 inches. It is crated from above by three strips of iron, which run the entire length and keep the charge of fuel from falling down into the draft and choking it up. The cartridges are run in on two girders of iron, and with one charge, it is claimed, the stove will run for an hour under ordinary circumstances. The oven is located beneath the fire box or cartridges, and the flame is carried over it down the front of the stove and underneath the oven. The concern which has been formed to manufacture this device is known as the Straw Burner Stove Company, with offices in the Loan & Trust Building, Minneapolis, Minn. At present the stove is being made at the shops of the Peteler Car Works, where the experiments referred to were carried out.

Granoe Sard of Albany, N. Y., has taken a cottage for the summer at Magnolia, Mass., where he will spend a portion of his time.

The James Spear Stove & Heating Company, Philadelphia, are to furnish the ranges for a building operation of 400 houses at Overbrook, Pa.

The Superior Stove Company of Superior, Wis., have had under consideration an increase in the capital stock to $50,000. At the date of latest advices it was the intention of the company to resume operations this week and on a scale which would enable them to fill the orders already booked and take care of those which were expected to follow.

A very appreciative article concerning the Culter & Proctor Stove Company appears in the Peoria (Ill.) *Journal* of the 24th ult. The extent of the company's plant is stated, and the character of the goods made is set forth in full. From the general tone of the article the inference is drawn that the company are favored with good business, on which they are to be congratulated.

The recently organized and thoroughly equipped plant of the Central Stove Works Company of Lebanon, Pa., resumed operations on Monday, April 23, and the first cast was made on

Wednesday, the 25th. The works are now in good shape for business and the company propose turning out a line of stoves which will take a high rank as well as prove very popular with the trade. The officers and management are said to be more than pleased with the favorable start which has been made.

THE MANUFACTURERS' STOVE REPAIR COMPANY of Chicago were recently incorporated, with a capital of $15,000. The incorporators include Oscar Ludwig, William D. Meeker and J. Henry Delms.

OPERATIONS have recently been commenced in all departments of the plant of Zebulon Hunt, at Hudson, N. Y. A reduction of 10 per cent. was made in the molding shop, but as soon as business revives somewhat the old scale, it is said, will go into effect.

THE MOBILE STOVE & NOVELTY WORKS of Mobile, Ala., were recently organized, and the plant will be located on the site of the old cotton mill, at the corner of Theater and Royal streets. The Edgar-Nelson Foundry Company will also be consolidated with the new concern.

THE JOLIET STOVE WORKS of Joliet, Ill., are sending out a neat calendar for the month of May, in combination with which is an illustration of Moore's Air-Tight heater. The stove is shown with and without casing. The text states that in 1891 Moore's Air-Tight heater was an experiment, in 1892 it was an acknowledged success, in the panic year, 1893, the company sold twice as many as in 1892, while for 1894 it is intimated that "it is time for every live dealer who values the agency of a profitable specialty to procure it."

THE PORTLAND STOVE FOUNDRY COMPANY, Portland, Maine, recently purchased a brick building on Kennebec street and propose to open a retail department. One of the latest productions of the company is an aluminum tea kettle, which they are now placing on the market.

THE CRAIG-REYNOLDS FOUNDRY COMPANY of Dayton, Ohio, present in an attractive catalogue, which has just been issued from the press, some remarks relative to the Triumph warm air furnaces which they manufacture. These goods are the result of years of experience and observation and are said to "combine every convenience and improvement that modern inventive genius can devise. They have been constructed with especial reference to heating capacity, durability and economy, as well as common sense principles of sanitary heating and ventilation, and are manufactured with special reference to the economical and thorough heating of residences, churches and schools." The Triumph furnaces are adapted for using hard or soft coal and are made in three sizes, portable form. The Triumph King, likewise arranged for burning hard or soft coal, is made in portable form and also for brick work. It is made in four sizes and has fire pots ranging from 20½ inches in diameter in the smallest size up to 30 inches in diameter in the largest size. The catalogue consists of 16 pages, is neatly printed and is bound in attractive covers.

SAM S. UTTER of 113 Beekman street, New York, has received from his foundry a new oil stove known as the No. 40 Game Lamp. It has a four hole top and is finished in either plain black or nickel plated. The tank is made in one piece and is regarded as a great improvement over the old style. Mr. Utter appointed on a recent Western trip the following agents in the cities named: Burtis & Co., Troy, N. Y.; C. B. Baker, Cleveland, Ohio; O K. Stove Company, Louisville, Ky.: Freeman, Delamater & Co., Detroit, Mich.; Jacob Retterer, Chicago; A. J. Lindemann & Hoverson Co., Milwaukee, Wis., and the Maxwell Brokerage Company, Denver, Col. The agent for the Eastern States is H. M. Carey, located at Boston, Mass.

RATHBONE, SARD & CO. have been granted this year two patents on their Acorn radiator, one covering the design and the other the construction. The patents embody the essential features which have made the stove so popular with the trade. The makers, we understand, have no desire to monopolize so important an invention, and have decided to offer to a limited number a license to use the inventions described in letters patent No 516 617 and covering the constructive features of the stove, but they will not license any one to use their design patents.

THE ELLWOOD GAS STOVE & STAMPING COMPANY of Ellwood City, Pa., have placed on the market a new gasoline stove known as the Perfect Safety. It is a new cheap step stove, made in two sizes, one having two individual burners and the other three in the top surface, and a double burner on the step at the left. The area of the top of the smaller size measures 15 x 22 inches, while that of the larger is 16 x 32 inches, the hight from the floor being in each case 29 inches. The step is 12 x 18 inches in area and stands 22 inches from the floor. These goods are provided with the company's removable automatic shut off Perfect Safety tanks. The stoves are referred to as being light, strong and durable, made of stamped steel throughout, neatly japanned and ornamented.

THE SUPERIOR FURNACE COMPANY of Little Falls, N. Y., are directing the attention of the trade to their lines of specialties by means of a neat folder, lithographed in colors. Illustrations are given of the Superior steel range, which is shown with high closet and reservoir; the new warm air Superior heater with top return flue and adapted for hard or soft coal; the Superior furnace with heavy all cast iron dome and either steel or cast iron radiator, and the Superior dome furnace, intended for using hard or soft coal, coke or wood as a fuel.

THE LITERARY DEPARTMENT of the Michigan Stove Company has favored us with two entertaining poems, daintily gotten up, nicely printed, and altogether captivating. One is entitled "So Different," and illustrates sundry trials in wedded life which were only ended when an investment was made in a Garland stove. The other is entitled "Stoves and Sunshine," and is a eulogy of the Yankee stove by Eugene Field, who versifies his experience in countries unblessed by the heat giving apparatus which is in vogue throughout this country.

R. ROBINSON & SONS, 105 Lake street, Chicago, are agents for the Northwest for the Model steel range made at Portsmouth, Ohio, and have succeeded in establishing a fair trade for it.

F. MEYER & BROTHER COMPANY of Peoria, Ill., have recently engaged in the manufacture of the Weir gas and soot burning furnace for heating with warm air. They have just issued a handbook of hints on warming and ventilation entitled "The House Comfortable." The book contains 48 pages, of which the first 32 pages are taken up with a very interesting treatise on warming and ventilation. The writer is evidently a man of long and varied experience and possessed of a high power of searching investigation, while he is at the same time a master of vigorous English. His illustrations are forcible and always well pointed, and his suggestions are eminently practical. The remainder of the book is devoted to setting forth the special features of the Weir furnace, of which full illustrations are given, portable and brick set, perspective and sectional. Scattered throughout the book are illustrations of buildings in which the Weir furnace is used for heating.

WE HAVE RECEIVED from the William G. Fischer Mfg. Company, Kokomo, Ind., four fine photographs of their Columbian wrought range. One shows the range with a high shelf, another with high shelf and low closet, the third with high closet, while the fourth is a double oven range with high shelf and low closets. A description of this range was given in a previous issue.

THE BUCKWALTER STOVE COMPANY of Royersford, Pa., will this season introduce to the trade the Star Canopy, a five or six hole range, in six sizes. It has a side ash pit, right or left oven door, nickeled name and number plate, elevated shelf, and will be furnished with or without a reservoir. Another new range will be the Bright Canopy, a full six hole range in four sizes. In square heaters they will introduce the Colossus, a high priced stove with full revertible flue and fully nickeled. They will also have ready for the season's trade the Gem Ringgold, a handsomely finished and nickeled cheap square parlor heater; and the Aldine, a sheet iron base burner. Their Laura sheet iron double heater will be somewhat changed and will appear this season with sliding doors.

THE GRANDER STOVE COMPANY of Royersford, Pa., are preparing some additions to their lines for the coming season's trade. In ranges they will introduce the Venus, a six hole range made in two sizes, with and without reservoir, large front ash pit, right hand oven door, pipe shelf and elevated warming shelf. A first-class range in every respect. Another range will be the Mentor, a medium priced article in two sizes, five and six holes, with side ash pit, right and left oven doors, with and without reservoir, and pipe shelf. In heating stoves they will bring out the Milton, a medium priced sheet iron base burner. Their line of Volga square heaters which they put on the market last season will be augmented by the addition of a larger size, to be known as No. 15, made in two parts and heavily constructed. They will make an addition to their line of Mars square heaters by the introduction of a new direct draft and revertible flue single heater. Their Bride range is to be redressed, and will appear with a new skirt and pipe shelf.

THE MOUNT PENN STOVE WORKS of Reading, Pa., will place on the market this season some new goods, among them the Penn Pride, a sheet iron base burning stove, half revertible flue, nickeled base and foot rail, nickeled crown top band and full nickeled swing cover; the Penn Pearl, another sheet iron base burner, with full revertible flue and double foot rail; the Penn

Coin, also a sheet iron base burner, with straight draft and single foot rail; the Penn Prize, a full nickeled square heater, in single and double styles, designed to meet the demand for a cheap square stove. Their line of furnaces will be augmented by the Palace, a steel drum furnace with horizontal hot air flues, and made in sizes running from the size suited to the requirements of a very small house upward. This furnace is constructed to meet the market for an extremely cheap article. They are reconstructiug the Penn City, a small five or six hole range with stationary ash pit, and the Penn Item, a small six hole range with detachable hearth. The appearance of these ranges will be much improved.

The Michigan Stove Company have prepared a large pictorial hanger which they are now distributing to their customers. It is intended as a time saver, but also answers an excellent purpose as a constant advertisement This hanger is 44 x 27 inches in size and is devoted to the new Garland cooking goods. It shows handsomely engraved pictures of 32 different ranges and cooking stoves manufactured by the company, and thus saves merchants and salesmen the trouble of referring to the catalogue. The hanger is printed in colors, the background being a light blue, around which runs a neat crimson border, while ornamental scrolls separate the nine groups of ranges and stoves from one another. In the matter of cast ranges four styles are shown for each group. In cooking stoves three styles are shown for each group. There are two groups of wrought ranges with three styles in each group. In looking over this array of fine cooking goods the thought naturally occurs that the man or woman who cannot be suited in such a collection must be extremely hard to please.

John P. Schaffer, 18 Wood street, Pittsburgh, Pa., manufacturers of the Novelty wall pipe, has just returned from his regular spring visit to the East, where he has been looking after the interests of his goods and purchasing stock for the coming season.

The New York office of the Howard Furnace Company celebrated May Day by a new coat of varnish on the sample of the Howard furnace which is in front of their place at 210 Water street. They will furnish five combination Howard furnaces for some residences in course of erection at Twenty-second and Walnut streets, Philadelphia.

W. G. Greamer & Co., 96 John street, New York, have in course of completion some new designs in hot air registers which will be ready for the trade during the summer. They make a specialty of brass goods, and show a fine line of tea kettles of ornamental design, such as are used with an alcohol lamp.

W. H. Pfahler, treasurer of the Abram Cox Stove Company, Philadelphia, made a visit to the New York office at 305 Pearl street this week.

The following item relative to the extending use of gas stoves is taken from a recent issue of one of the New York dailies: During the last five years a great deal of money has been invested in the perfection and manufacture of gas appliances, and the missionary work which the agents of these different manufactories have been making in the different cities, especially in New York, is beginning to tell. Last summer a large number of apartment houses were fitted up exclusively with gas stoves. These experiments gave such satisfaction that not only apartment house proprietors, but individual renters of flats are making for these conveniences, which secure perfect combustion, the saving of hours of time, money and discomfort. It is estimated that when gas stoves are substituted for the old fashioned coal furnaces the radiant heat of New York will materially diminish, and this is a matter of importance to the many who must live in New York all the year round and in apartment houses provided with a blazing coal stove in each apartment from early morning until nightfall. In London 150,000 gas ranges are already in use, and it is believed that New York will follow the example very quickly.

Gasoline stove manufacturers have for years been handicapped by the almost universal opinion that gasoline stoves are dangerous, and this opinion has been encouraged by the daily press reports of what are styled "gasoline stove explosions." C. A. Stockstrom, secretary of the Ringen Stove Company, gives a case in point. A few days since an explosion occurred in a dwelling house in St. Louis, where the occupants had a gasoline stove, the explosion resulting in the death of two persons and the serious injury of two others. The daily press heralded the explosion in their usual manner, heading it "Terri ble gasoline stove explosion." The facts in the case are as follows: The man of the household had gone out to procure a quantity of gasoline, and had it in a 5-gallon glass jar, with glass handle. Entering the summer kitchen where the gasoline stove was in operation the weight of the gasoline caused the handle to break and the jar falling to the floor broke. An explosion followed, as a matter of course. The gasoline stove was in no way to blame, as had an ordinary cook stove been in use the same explosion would have occurred. It would be well for dealers in whose localities so-called gasoline stove explosions occur to investigate the circumstances, and in nearly all cases the fault will be found, not with the stove, but in the carelessness of the operator.

One of the newest productions of the Kernan Furnace Company, Utica, N. Y., is the Kernan range. It is of the double oven variety and is made in three sizes. It is furnished with either a plain, Dockash or duplex grate, and all arranged so that they can be removed through the front without difficulty. The fire chamber is of ample size and fitted with a reversible water back, that can be used on either side of the fire chamber. The ranges are provided with warming ovens and have a handsome high shelf, large flues and free access to them for cleaning being special features. In size and shape the range has been designed to meet the requirements of the New York market.

Exports of stoves and ranges and parts of the same from the United States to foreign countries during the nine months ended March 31, 1893, were of the value of $178,175, as compared with $161,446 in the corresponding period of last year.

Harry King, representative of the Kernan Furnace Company of Utica, N. Y., is making New York City his headquarters while visiting the trade in near by towns. *The Metal Worker* was favored by a call, when his line was shown by nickel plated model and the features explained. The man who sells the goods is always a welcome visitor.

The Bulkeley is the latest addition to the line of furnaces of the Bulkeley Stove & Range Company, 104th street and Lexington avenue, New York. Those that were in use during the past winter are said to have given excellent satisfaction.

M. Abbott's Sons, Seventeenth street and Eighth avenue, New York, are making a specialty of their hot air furnace business. They have a full line of furnaces on their sample floor which they call the Union. They are provided with a labor saving grate, and the radiator is so constructed as to present a large heating surface and effect an indirect draft.

A. L. Canfield, the New York representative of the Danville Stove & Mfg. Company, Danville, Pa., has many attractions for the stove dealer at 284 Pearl street. The company are the Eastern agents for the Monarch gasoline stoves made by the Baxter Stove Company of Mansfield, Ohio, and report a growing interest in this line of goods in New York and vicinity. A display is made of every variety of these stoves from the cabinet Monarch to the low junior. They are also agents for the Model steel ranges, made by the Portsmouth Stove & Range Company of Portsmouth, Ohio, and find that these goods are being shown some favor by the builders in this vicinity. The large flues used in steel range construction enable these goods to prove satisfactory in operation in chimneys where the cast iron ranges with flues of less generous proportions fail to give prompt and satisfactory results. These ranges are provided with all the labor saving devices of high-class goods, and are of very attractive appearance. They have just put on the floor the new Queen Beaver, their highest grade range. In design and ornamentation this range is quite handsome. It is provided with either a triplex or duplex grate, has ventilated oven, cut centers and a top which, they claim, is specially adapted to overcome the breaks frequently occurring in range tops and to maintain a continuously level top. The range is made with ovens 21 and 23 inches square and 13 and 14 inches high. It is furnished with the Waterman or a non expanding cover. It is set on a heavy ornamental base, has a nickel plated top edge and an ornamental nickel plated back guard, to which swinging plate warmers are attached. The 8-16 is a new size added to their line of the King Beaver that has a nickel back guard, and a feature which will be attractive to the housewife is a large and convenient ash pan.

The Ontario Bureau of Mines has received information of a discovery of tin ore which, it is claimed, has been made in the vicinity of Sudbury, Canada.

Early in May will begin the competitive tests of machine guns at the Indian Head proving grounds. Several types will be submitted, including the Gatling, Accles, Maxim, Gardner and others. From these weapons one will be selected for adoption in the naval service, in order to secure a uniform class of guns and ammunition for all the ships. At present two or three styles of machine guns are provided for the navy, there being no standard.

TRADE REPORT.

The Iron Market.

The situation is dominated by the Coal and Coke strikes. So far as the producing interests are concerned the state of affairs is very much mixed. The blast furnaces of the valleys and of the Pittsburgh, Wheeling and Cleveland districts have felt the Coke strike first. Edgar Thomson, Laughlin and Stewart have stock enough to carry them along. The majority of the other stacks have either banked or blown out or will do so within a short time.

Even some of the furnaces in Central Pennsylvania who could use anthracite threaten to bank because it would run up the cost. The anthracite stacks proper will find their capacity reduced when the usual admixture of Coke to the burden is dropped.

In the foundry grades of Pig Iron there has been no stiffening, because until now the Southern plants have kept running. Besides, there is quite a fair stock for the moderate current demand.

As for the strike itself, the general opinion is that the men are hardly in a condition for long idleness. Besides, there is the significant fact that the Flat Top and Cumberland districts, two very large contributors to the supply, are fully at work.

On the other hand, it is conceded that wages in some sections have been unduly low, and it is rumored that some interests in the Connellaville region will grant the demands of the men. A very weak point of the position of the labor leaders is that they will not allow resumption, even if the demands are granted, locally, unless the surrender of the operators has been general.

Pig Iron.—The New York and New England markets have been very quiet and have not as yet been affected in any way by the Coal strike. It is probable, however, that some of the Alabama furnaces will have to bank if the labor situation does not soon improve in that district. In Bessemer Pig we note a sale of 10,000 tons at private terms by an Eastern Steel works. We quote standard brands $12.50 @ $13.25 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9 75 @ $10.25.

Our Philadelphia representative writes as follows in regard to the Pig Iron market in that district: Foundry Irons are not affected by the strike to the same extent as those used for Steel making, and while there is a fairly good demand, buyers can get almost anything they want at last week's prices. Eventually, however, it will affect both ends of the market, as Pig metal can neither be consumed nor produced without the regular fuel supply, so that what affects one will affect the other. Under these circumstances there is no movement to indicate any decided change in values in either direction, sellers being about as anxious to do business at former prices as they usually are, particularly when the order is from gilt edged parties. Quotations are so diverse that they can only be given in general terms. Some buyers claim to be getting first-class No. 2 Foundry X at very close to $11, delivered at points equal to Philadelphia, while sellers of leading brands claim $12 @ $12 25 as their minimum. The question arises whether the low priced Iron is of the grade represented, but as it answers the purpose of the consumer the name or grade is of little account. This is doubtless a temporary condition, and the quotations herewith given are merely a general indication of what sellers ask, rather than as representing actual sales—except in a small way:

Standard No. 1 Foundry X	$12.50 @ $12.75
Standard No. 2 Foundry X	11.75 @ 12 25
No. 2 Plain	10.75 @ 11.00
No. 1 Soft	11.50 @ 12.00
No. 2 Soft	10.75 @ 11 00

In the Chicago market transactions in local Coke Iron have been on a little better scale, but Southern Iron shows no improvement whatever. The Coal strike in the South has not yet caused prices to be advanced by the Southern companies, although sales agents are daily in expectation of orders to mark up their rates. Lake Superior Charcoal continues neglected. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @ $15.50
Local Coke Foundry, No. 1	11.25 @ 11.50
Local Coke Foundry, No. 2	10.50 @ 11.00
Local Coke Foundry, No. 3	10.00 @ 10 50
Local Scotch	11.50 @ 11.75
Ohio Strong Softeners No. 1	12.60 @ 13.50
Southern Silvery, No. 1	..... @ 11.50
Southern Silvery, No. 2	..... @ 11.00
Southern Coke, No. 2	10.00 @ 10.35
Southern Coke, No. 3	9.75 @ 10.00
Southern, No. 1, Soft	10.25 @ 10.50
Southern, No. 2, Soft	9.75 @ 10.00
Tennessee Charcoal, No. 1	15.00 @ 15.50
Tennessee Charcoal, No. 2	14.50 @ 15.00
Alabama Car Wheel	17.85 @ 18.00
Jackson County Silvery	15.00 @ 16.00
Other Ohio Silvery	12.50 @ 13.00

The Coke strike has caused the shutting down of many furnaces in the Pittsburgh district, and has brought about a famine in Bessemer Iron for close delivery, so that it can hardly be had at any price. Buyers are taking only what material they absolutely need, but for such purchases they are paying from 50¢ to $1 advance. Foundry Irons are firmer and for close delivery show a slight advance. For prompt delivery the following quotations are ruling:

No. 1 Foundry	$11.25 @ $11.50, cash
No. 2 Foundry	10.40 @ 10.75 "
No. 3 Foundry	10.00 @ 10.25 "

Sales are noted by our Pittsburgh agent of 25 tons of No. 2 Foundry at $10.40, 25 tons at $10.60 and 50 tons at $10 75, for May delivery.

Advices from St. Louis indicate that the Coal strike has not as yet had any effect on prices in that market, and there seems to be plenty of Iron to fill all orders for the present. Transactions are almost entirely confined to small lots, the largest single sales for the week running up to 300 tons. Quotations are made as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.75 @ $11.00
Southern Coke, No. 2 Foundry	9.75 @ 10.00
Southern Coke, No. 3 Foundry	9.50 @ 9.75
Southern Car Wheel	16.75 @ 17.75
Lake Superior Car Wheel	16.25 @ 16.50
Ohio Softeners	14.25 @ 14.50

Business during the week in the Cincinnati district has been very dull. The only transaction beyond the few current consumption sales, which were inconsiderable, was a sale of 1500 tons of No. 2 Foundry, and this was made on the basis of $675, f.o.b. Birmingham, and for long forward delivery. Consumers in the district have about all the Pig Iron they require in the early future under contract, and there are few applications from the East or elsewhere for new supplies. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke, No. 1	$10.25 @ $10.50
Southern Coke, No. 2	9.25 @ 9.50
Southern Coke, No. 3	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.00 @ 14.50
Lake Superior Coke, No. 1	12.50 @ 13.00
Lake Superior Coke, No. 2	11.50 @ 12.00
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.00 @ 13.50
Tennessee Charcoal, No. 2	12.00 @ 12.50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable	16.25 @ 16.75

There has been no change in Pig Iron prices in the Louisville, Ky., market as a result of the Coke strike. Furnaces are, however, not inclined to sell heavily until they see the effect upon the Iron industry of the disturbances in the coal fields. Among Pipe shops, Car shops, and Stove foundries there is yet great complaint of the low prices finished materials have to be sold at. Quotations, for cash, f.o.b. cars Louisville, Ky., are as follows:

Southern Coke, No. 1 Foundry	$10.25 @ $10.50
Southern Coke, No. 2 Foundry	8.75 @ 9.25
Southern Coke, No. 3 Foundry	8.50 @ 8.75

Metal Market.

Pig Tin.—There has been a sharp rise in prices and more activity in business. Even the speculative branch of the trade has been infused with a little animation, making, in all, a condition of affairs somewhat in contrast with the flatness that prevailed up to within a very recent date. At the end of last week dealings were recorded to the extent of 150 tons at 19.75¢ @ 19.85¢ spot, 19.67½¢ May delivery, 19 67½¢ June, and 19.70¢ September. On Tuesday the interest became livelier and carried prices still higher in the face of a bank holiday in London. Sales were recorded to the extent of 75 tons at 20.05¢ @ 20.10¢ for May delivery, 19.95¢ for June, 19.95¢ for July and 20¢ for August, while as high as 20⅛¢ was bid for spot. In the latter there was a clean advance of 0.42½¢ from the lowest point of the week, and the distant futures moved up to the extent of about 0.30¢ during the interval. The feeling was somewhat quieter later in the week, but offerings at less than 20.15¢ were the exception on either prompt or future delivery. Prices for small lots of the metal are unchanged at last week's quotations—namely, 21¢ @ 21¼¢ per lb for Straits Pig, with an advance of 1¢ per lb in Bars.

Copper.—The market is rather weaker in appearance. Offerings of Lake Su-

perior Ingot at 9½¢ have not met with response except where very small quantities were involved. Fair sized lots offered at 9.45¢ found very limited outlet and poor results attended efforts to draw out bids of 9.40¢ on larger quantities. As not unusual on a soft market, rumor had it that still lower prices were not out of the question, since the European market has not netted over the parity of 9¼¢ for some time past. Electrolytic apparently stands in rather better position, since home purchases continue on a fair scale and 8¾¢ @ 9¼¢ cover the extremes of prices. Casting stock has not varied from 9¢ @ 9¼¢ in price, but finds merely routine sale. Jobbing business in both Ingot and Manufactured Copper has been unusually limited in extent, while prices are inclined to be soft.

Pig Lead.—There has been slightly freer offerings by some producers. Speculators who carried a few carloads since early in the year unloaded also. Both movements came just at a time when consumers were very indifferent buyers. Between them they forced prices lower and for a time gave the market a weak appearance. About five carloads went at 3⅞¢. That, however, disposed of the liquidation. Subsequent bids of the price named were ineffective in leading to business, and 3.42½¢ @ 3 45¢ would now seem to be strictly inside rates for Western brands. Bids of 3 40¢ were refused. Nothing more than a routine business is doing and consumers evince little interest beyond the supplying their absolute needs. Jobbers' prices for small quantities of American Pig rule at about 3¾¢ @ 4¢ ℔ lb.

Lead Sheet and Pipe.—The market for Plumbers' Supplies in this vicinity is extremely dull. Building operations in hand are so limited and those in prospect are so uncertain that the demand for this class of material has fallen far below the average. This condition of things, however, seems to be more or less local, as reports from other sections of the country are much more favorable. Prices for Lead Pipe and Sheet Lead, while nominally maintained, as per list, can without much difficulty be shaded.

Spelter.—Since our last report a good portion of late accumulation in the West has been disposed of. This and the fact that production has been reduced considerably served to stiffen prices and give the market better tone. Eastern consumers, however, have purchased in a moderate way and are indifferent buyers at the present time. On good Western brands the popular quotations are 3.55¢ @ 3.60¢ for delivery here or at common point, with an advance of about ¼¢ ℔ lb on small lots from store.

Tin Plates.—No improvement can be noted in the demand for any line of Plates. The market appears soft as well as peculiarly dull for this season of the year. Orders run quite as small as they did a week ago, and are not more numerous, although some dealers mention a slightly increased interest in future deliveries. On the whole, the market is commonplace and business disappointing. The first days of each month usually bring in to the dealers an accession of orders from the smaller trade, but nothing of the kind has occurred at this time. The demoralization of the trade is attributed on all hands to the uncertainty existing in regard to the tariff. Stocks are in such a shape that when that question is settled, or in a fair way to be so, the chances are in favor of a good movement of business. Shipments from Europe continue comparatively small, and stocks on this side, both in and out of bond, are lower than has been the case for years. Importers find it cheaper, under present conditions, to carry their purchases of Plates on the other side, sending over for them as they may be needed. Even some of the larger consumers are leaving portions of their purchased stocks in bond at American ports and drawing from them gradually according to their requirements. Prices are inclined to weakness, concessions being easily made on desirable orders. A London cable dispatch to *The Iron Age*, dated May 2, reports on the British market as follows: The Tin Plate market remains dull, although there has been rather more doing in 14 x 20 Cokes for prompt shipment. Prices continue low and rather weak. Stocks at Swansea are now about 257,000 tons. Shipments latterly have been heavy. Good orders reported for Black Plate. Liverpool quotations are as follows:

IC Charcoal, Alloway grade	12/ @ 12/6
IC Bessemer Steel, Coke finish	11/3 @ 11/6
IC Siemens " "	11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20	Nominal.
Charcoal Terne, Dean grade	10/3 @ 10/6

Sheet Iron.—Some good sized orders have been placed for Black Sheets, and others are said to be in prospect. The mills are reported as being well supplied with work, some of them for as long as 60 days ahead. Jobbers, however, complain of an absence of life in this line of trade, the fact being that the tendency to purchase even small quantities of Sheet Iron direct from the mill instead of through the dealer is becoming more pronounced, Both in Black and Galvanized Iron there is, at present rates, but a very slim profit for the jobbers, many of whom delare they would sooner not handle the material at all. A very active demand exists for Black Iron of light gauge for trimming purposes. Galvanized Iron moves somewhat heavily. Prices are, however, fairly well maintained. Some good export orders for Galvanized Sheets for Cuba have been lately filled.

Aluminum.—A reduction has been made in the price of Ingot Metal in ton lots from 55¢ to 50¢ ℔ lb for No. 2 grade, and from 60¢ to 55¢ for No. 1 grade. The base price of Aluminum Sheet has been reduced from 90¢ to 80¢ ℔ lb; Aluminum Wire Rods from $1.20 to 90¢ ℔ lb, and Nos. 9 to 14 gauge Wire from $1 25 to $1 ℔ lb.

Chicago Report.

Scrap.—Transactions are very limited. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Thus far the Western miners' strike has had no effect on the hard Coal market. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5 25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6 75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6 55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

The Sheet Iron Trade.

The coal miners' strike has proved a source of great trouble and annoyance to rolling mill operators and other manufacturers throughout Ohio. When the strike was announced every manufacturer did everything possible to secure a supply of coal and some were successful. Among the number, and probably the most fortunate, is the Cambridge Rolling Mill Company. This concern own their own coal mine, and in consequence now have several thousand tons in sight. At Bridgeport natural gas has been resorted to, although a strong effort was made to induce the Ætna Standard miners to go in at an increased rate of wages. Other mills have moderate supplies on hand which they are using very carefully, running only the finishing departments by using up accumulated stocks of partly finished material. This trouble brings to notice once more the wonderful vitality of the sheet iron end of the rolling mill industry. As soon as mills commenced to shut down, buyers of sheets, particularly roofers, were on the road looking for a place that could supply immediate wants, and with few exceptions large consumers of sheets are asking for quicker deliveries. Several mills have sold their products up to July 1 and others can see enough business in sight to keep things moving until that time.

The little spurt of business among iron and steel roofing concerns which was referred to recently is now confirmed. The best proof of this is that roofers' stocks are running lower than they have during many months.

The Bellefonte Boiler Works, W. T. Maitland, proprietor, is the subject of an extended notice in a recently issued industrial edition of the *Keystone Gazette* of Bellefonte, Pa. The specialty of this enterprise is the manufacture and repair of all kinds of steam boilers, stacks, tanks and sheet iron work generally.

E. C Stearns & Co., Syracuse, N.Y., in connection with their plant, in which a large variety of goods are manufactured, have a large foundry equipped in the best manner and are in excellent position to furnish Gray Iron Castings for other manufacturers.

CONDITION OF THE

Hardware Trade.

DURING APRIL the demand was somewhat spasmodic and uneven. The month opened with trade that was somewhat disappointing, but the last half of the month showed a perceptible improvement. On the whole the aggregate of business was fair. May opens without any special change in the general situation, a good many orders coming in from the trade, but mostly for small quantities. In the matter of prices the market continues weak, although it is a question whether or not in many lines the bottom has been reached. The low price of raw material, the reductions which have been made in wages, and the economies to which manufacturers resort in the production of their goods, have the effect of diminishing costs to a point considerably below that of former years, and the desire on the part of manufacturers to keep their works in operation has the effect of inducing them to make such concessions in prices as will enable them to market their goods. There is consequently in many lines a gradual shading of quotations. This is not confined to manufacturers, but the jobbers also desiring to hold their trade and dispose of their stocks are offering inducements in the way of low prices. The fact that many retailers who are careful buyers are purchasing in unusual y small quantities prevents them doubtless in many instances from obtaining as low quotations as are within their reach. The probable duration and effect of the coal strike is being regarded by the trade with much interest, and its effect is already slightly felt on some goods which lie near the raw material, inasmuch as it induces an element of uncertainty, in view of the fact that if long continued it would produce a scarcity of fuel and cause the shutting down of works. Some manufacturers are therefore disposed to ask slightly advanced prices on some lines, but the trade are not as yet disposed to pay any increased price. The general anticipation is that May will be characterized by a fair but not heavy trade.

Advices from Chicago.—Now that April has ended and a comparison of the volume of business in Shelf Hardware can be made, it is found that the aggregate for the month was but a trifle under that of March. The early part of April was a quiet period, but business picked up considerably during the latter half, which accounts for the excellent showing now made, and yet the condition of business in Shelf Hardware is by no means what it should be. In some cases this spring it has been necessary to considerably decrease the force of salesmen. Wire Cloth has firmed up during the week, and jobbers are now trying to get $1.50. Prominent manufacturers are withdrawing all quotations. Jobbers further West are advising the Chicago trade that they are prepared to follow their lead in putting prices up. Heavy Hardware shows no special improvement, but fair inquiry is noted for Carriage Makers' Supplies. This branch of trade is in a different condition from previous seasons. Contracts are usually placed early in the year by carriage manufacturers, but this season they have not done so, and consequently they are purchasing stock steadily from week to week.

Notes on Prices.

Wire Nails.—The market is scarcely as active as it has been, but there is still a good demand. In the matter of prices there is a somewhat improved tone, and manufacturers are disposed to withdraw some of their extreme quotations, particularly on the ground of the uncertainty as to the duration and effect of the coal strike. On the whole, however, the market remains in substantially the same condition as at our last report, being represented by the quotation of 95 cents for carload lots at factory, a figure which still can probably be shaded. Small lots from store in New York are held at $1.15 to $1.25.

Advices from Chicago.—The early part of last week prices were in a seriously demoralized condition. Some manufacturers became apprehensive as stocks slid up in their warehouses, and they made strenuous efforts to unload them. Later in the week, however, the situation changed materially. The coal famine began to have its effect, and when it was seen that some of the largest concerns would very shortly be obliged to shut down for lack of fuel the Nails in warehouses began to look more valuable. Prices have consequently stiffened, and, as usual when this takes place, inquiries become larger and specifications on old orders came in more freely. Quotations on factory lots now range from $1.05 to $1.10, Chicago, and if the coal strike does not soon end they will go higher. Stocks in dealers' hands have been pretty well run down, and are in such condition now that an advance by manufacturers will immediately be responded to by the jobbers, who for the present are quoting small lots from stock at $1.10 to $1.15.

Cut Nails.—There continues to be a fair but not heavy demand for Cut Nails, and the market, on the whole, is in about the same condition as last week. The Eastern mills are holding up prices pretty steadily, the principal disturbing factor being the entrance into Eastern territory of Western Nails, which are being offered and to some extent sold in Baltimore, New York, Philadelphia and other points through the Middle States. The Western price is represented in a general way by the quotation of 90 cents for carload lots at mill, but this is shaded 5 cents and in some cases more, especially when placing Nails in Eastern territory. The price of Nails delivered in New York is 95 cents to $1 base, small lots from store being quoted regularly at $1.10 to $1.15.

Advices from Chicago.—Manufacturers report a falling off in orders since last report and some weakness in price, owing to competition from factories in other districts. The local makers continue to quote factory lots on a basis of 95 cents, Chicago, for 55 cent average. Jobbers are holding small lots from stock at $1.05 to $1.10.

Barb Wire.—There is a perceptible falling off in the demand for Barb Wire. There is, however, a fair business still doing. The irregularities in price to which we have referred still continue, and while the market is represented by the following quotations for Four Point Galvanized, delivered at the points named, it is not unlikely that they could be shaded: Pittsburgh, $2.05 to $2.15; Cleveland, $2.10 to $2 20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.20 to $2.30.

Advices from Chicago.—Manufacturers report a very good condition of business with some sections of the West, which keeps their order books in fair shape. The demand is particularly good from the Southwest. Business latterly has picked up to some extent with the Northwest, but orders from this section have seldom exceeded carload lots, being mainly for lots of two to three tons. Prices are unchanged at about $2.15, Chicago, for factory lots of Galvanized Barb Wire and $2.30 to $2.40 for small lots from jobbers' stock.

Plain Market Wire.—A fair but not especially heavy business is being done in Plain Market Wire, and prices continue as they have been for some time, low and somewhat uneven, the competition between the mills being active. Base sizes are being sold at $1.30, f.o.b. mill, with proportionate advances for the small sizes. Galvanized is regularly quoted from ½ to ¾ cent advance, but in some cases it is bought at $\frac{4}{10}$ cent advance, there being an apparent tendency to diminish the extra.

Hawthorne Julep Strainer.—Manning, Bowman & Co., Meriden, Conn., are putting on the market this Strainer, which is sold to the trade at $8 per dozen, subject to a discount of 25 per cent.

Adjustable Bathtub Seat.—This Seat is put on the market by the St. Louis Bronze & Aluminum Works, St. Louis, by whom it is sold from the following list, subject to a discount of 35 per cent. to the trade:

No. 1, nickel plated, ash wood bottom with oil finish	$3.50
No. 2, black enameled	2.50

Columbian Screw Plate.—This article is put on the market by Alfred Ely & Co., Baltimore, Md. The discount to the trade on the Screw Plate is 33⅓ per cent.

Simplex Cork Puller.—The Simplex Cork Puller, manufactured by Manning, Bowman & Co., Meriden, Conn., is sold at $31 per dozen, subject to a discount of 25 per cent. to the trade.

Cordage.—There are rumors of some changes in the management of the United States Cordage Company, and of other negotiations looking to the securing of harmony in Cordage interests. As a result of this and other influences the market is firmer and a slight advance has been made in price. The market is now represented by the quotation of 6½ cents for Manila and 4½ cents for Sisal in large lots, f.o.b. factory or New York, subject to the cash discount of 1½ per cent. The trade are placing their orders more freely than for some time in view of the possibility of still higher prices.

Glass.—Prices and conditions in the Glass market remain without change as reported last week. There appears to be no scarcity of the smaller sizes of Glass, but enough to carry the trade until fall. Desirable sizes of larger Glass, it is understood, are sought after, and the lack of sufficient quantity to supply future demand may ultimately result in a larger use of Plate Glass as a substitute. It is reported that the factories in operation represent a capacity equivalent to 1054 pots, which shows an increase of about 50 pots during the past month. Pittsburgh prices are reported as follows: In small quantities by jobbers, single strength, 80 and 10 per cent.; double strength, 80 and 10 and 5 per cent. discount. Factory prices are given as 85 per cent. discount for single and 85 and 10 per cent. discount for double strength Glass. Plate Glass remains firm at 70 and 10 per cent. discount.

Old Metals.—Old Metals are not in quite as good demand as they were a

week or two ago. Inquiries are moderate, but enough business is done, particularly in certain descriptions of Scrap Iron, to keep prices fairly steady. The following quotations represent about the present dealers' buying prices in this city:

Heavy Copper	℔ lb		7½¢
Light and Tinned Copper	℔ lb		6½¢
Heavy Brass	℔ lb		5½¢
Light Brass	℔ lb		4½¢
Lead	℔ lb		3¢
Tea Lead	℔ lb		2¢
Zinc	℔ lb		2¾¢
No. 1 Pewter	℔ lb		14¢
No. 2 Pewter	℔ lb		7¢
Wrought Scrap Iron, ℔ gross ton	$9.00	@	....
Heavy Cast Scrap, ℔ gross ton	7.00	@	....
Stove Plate Scrap, ℔ gross ton	4.50	@	....
Burnt Iron, ℔ gross ton	3.00	@	3.50

Old Rags, Paper, &c.—The market for Paper stock is moderately active, but prices remain at their former level. The following are the ruling prices, New York delivery:

No. 1 White Rags	℔ lb	3¼ @	3½¢
No. 2 White Rags	℔ lb	2 @	2¼¢
Mixed Rags	℔ lb		3¼¢
Blues and 3ds	℔ lb	1 @	1¼¢
Hard Sized White Shavings	℔ lb	2¼ @	2½¢
No. 1 White Book Shavings	℔ lb	1½ @	1¾¢
No. 2 White Book Shavings	℔ lb	1 @	1½¢
Light Book Shavings	℔ lb		¾¢
No. 1 Mixed Shavings	℔ lb	¾ @	1 ¢
No. 2 Mixed Shavings	℔ lb	½ @	¾¢
No. 1 Printed Books	℔ lb	1 @	1¼¢
Ordinary Mixed Books	℔ lb	½ @	¾¢
Newspapers	℔ lb	2-5 @	½¢
No. 1 Manila Paper	℔ lb	1 @	1⅛¢
No. 2 Manila Paper	℔ lb	⅝ @	¾¢
Bogus Paper	℔ lb		½¢
Common Paper	℔ lb		⅜¢
Straw Chips	℔ lb		⅛¢
Binders' Clippings	℔ lb	½ @	⅝¢
Jute Butts	℔ lb	1⅞ @	2 ¢
No. 1 Jute Bagging	℔ lb	1 @	1¼¢
Mixed Bagging	℔ lb	¾ @	1 ¢
No. 2 Bagging	℔ lb	½ @	¾¢
Hemp Twine	℔ lb	2 @	2¼¢
Manila Rope	℔ lb	2⅛ @	2¼¢
Jute Rope	℔ lb	1½ @	1¾¢
Mixed Rope	℔ lb	¾ @	⅞¢

Old Rubber.—The market for Old Rubber is fairly active. Prices rule about as follows, but are subject to variation and are somewhat irregular:

Car Springs, ton lots, ℔ lb.	....	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb.	....	@	.03½
Rubber shoes, less than carloads, ℔ lb.		@	.03¾
Large Hose, ℔ ton	....	@	12.00
White Wringer Rolls, ℔ lb.	....	@	.03⅜
White Syringes, ℔ lb		@	.03⅝

Trade Notes.

Metcalf & Morrison, 126 and 128 Polk street, Newark, N. J, are a new firm of iron founders making both light and heavy Castings for the trade in the foundry formerly occupied by Rupp & Son.

Under date of April 13 Randall & Becton, 110 Boylston street, Boston, Mass., manufacturers of the Merrill Aluminum Heater, notify the trade that Wm. H. Goss retires from the firm and is succeeded by R J. Gordon.

The advertisement of the Excelsior Steel Furnace Company of Chicago which appears in this issue treats of the subject of Boots. The company manufacture Boots of all sizes and all kinds for use at the bottoms of furnace stacks. Those who take the trouble to clip the coupon in the advertisement will find it worth $1 to them on their first order for such goods amounting to $10 or more.

The Springfield Coil Boiler Company, 48 Hampden street, Springfield, Mass., in an announcement elsewhere in this issue direct attention to the Springfield Coil Boiler of their manufacture. The apparatus is shown brick set, and also with casing removed, so its construction is readily understood.

Avery Stamping Company, Cleveland, with their extensive and well equipped plant, advise us that they are in a position to do all kinds of Tinning and Retinning of Steel or Copper and, in fact, all metals. The company will be pleased to furnish estimates to any one desiring to have Tinning or Retinning work done in large quantities.

The Fair Haven Marble & Marbleized Slate Company, Fair Haven, Vt., have a card in our advertising columns this week directing attention to Slate in all forms for plumbers' use, such as urinal stalls, sinks, closet slabs, basin slabs, &c.

The announcement elsewhere of Savill, Walla & Co., 1229 Budden street, Philadelphia, Pa., will be of interest to the plumbing trade, as it directs attention to Savill's Closet Connection for new, old or broken closets.

The page announcement of the Iron Clad Mfg. Company of 22–24 Cliff street, New York, is of more than usual attractiveness this issue. It tells of the Iron Clad Enameled Ware, the merits it possesses and the popularity it has won, and the illustration is a picture of a train of freight cars loaded with Iron Clad goods made for the Fair. An entire train load of such articles means an enormous quantity for a single shipment.

The advertisement elsewhere of John A. Scollay, 72, 74 and 76 Myrtle avenue, Brooklyn, N. Y., directs attention to the Scollay Hot Water Heater of his manufacture, and points out the purposes to which it is specially adapted.

The Security Gas & Vapor Stove Company, St. Louis, Mo., in an announcement elsewhere call attention to the merits of the Security Gas Range, which is described as new in construction and new in design.

S. Blumenthal & Co., Thirty-eighth street and Eighth avenue, New York, are making a specialty of the Kernan furnace, made by the Kernan Furnace Company, Utica, N. Y. They report a good business and very satisfactory results from the furnaces in use during the past winter.

The Petereit Mfg. Company have been incorporated in New York State, with a capital of $5000, to manufacture metal and other goods in New York City. The directors are: Albert H. Petereit of New York City, Olin F. Gleason of Arlington, N. J., and Doane N. Gleason of Brooklyn.

The present week witnesses the trials of the first two war vessels built at American navy yards for many years. These are the second class battle ships "Maine" and "Texas," the first named built at New York and the latter at Norfolk. The "Maine" will undergo her official horse-power trial and the "Texas" the dock trial of her engines. Both these vessels are built to develop 8500 horse-power, which, it is calculated, should give them an average speed of at least 15 knots an hour. It is not expected that the "Maine" and "Texas" will be ready for active service much before the end of the year.

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Metal and Miscellaneous Prices.

CHICAGO, MAY 3, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Vulcan and Delyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14. 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—

IC. 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—

IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal Extra, IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood —IC, 14 x 20.....$6.00
IC, 20 x 28.....12.50

Roofing Plates.

Palm, IC, 20 x 28.....@$11.25
Palm, IX, 20 x 28.....@ 14.00
Empire, IC, 20 x 28.....@12.00
Empire, IX, 20 x 28.....@15.00
Hickory, IC, 20 x 28.....@ 12.50
" IX, 20 x 28.....@ 15.50
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 15.00
" IX, 20 x 28.....@ 18 00

Westmoreland:
IC, 14 x 20..... $6.00
IC, 20 x 28..... 12.00

Elwood:
IC, 20 x 28..... $11 50

Furmston:
IC, 20 x 28..... ...$11.00

Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50

Illinois, Old Method:
IC, 20 x 28.....$17.00

E. L.:
IC, 20 x 28.....$12.50

Jessie:
IC, 20 x 28.....$13.00

Scott's Extra Coated, Stamped and Resqared, IC, 14 x 20.....$9.50
Scott's Extra Coated, Stamped and Resqared, IX, 14 x 20.....11.00
Scott's Extra Coated, Stamped and Resqared, IC, 20 x 28.....19.00
Scott's Extra Coated, Stamped and Resqared, IX, 20 x 28.....22.00
Neville, Stamped, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28.....12.50
" " IX, 20 x 28.....15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resqared).....$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resqared).....19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resqared)..... 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resqared).....16.50
Columbia, IC, 14 x 20 (Stamped)..... 7.25
" IC, 20 x 28 (Stamped)....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28.....13.00
Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28.....12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 .....12.00
Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28..... .....12.00
" IX, 20 x 28.....15.00
" (Redipped), IC, 20 x 28.....17.00

Old Process:
IC, 14 x 20..... 9.25
IX, 14 x 20.....11.25
IC, 20 x 28.....18.50
IX, 20 x 28.....22.50

H. B. L., Old Style:
IC, 14 x 20..... ..... 7.75
IX, 14 x 20..... 9.25
IC, 20 x 28.....15.50
IX, 20 x 28.....18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 3-10¢	3 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5-10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.... dis. 75@77½%

Copper—

Ingot.

Lake.....10½¢ @ 11¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list, 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.33
Plain, ½ inch no to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter..... 4¢

Sheet Zinc—

600 ℔ casks.....4.50¢
300 ℔ casks.....4.70¢
Loose sheets..... 4.80¢

Lead—

Soft Pig Lead.....4 ¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....13¢
Hallett's.....12¢

Wrought-Iron Pipe—

1¼ and under, Plain.....60&10%
1¼ and under, Galv.....52½&10%
1½ and over, Plain.....70&10%
1½ and over, Galv.....60&10%
Boiler Tubes, list Oct. 24, 1892....70&10%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 5 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....55¢
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.50 square
Climax.....$3.35 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.50 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....7¼@8 ¢
Iron Paint, Bright Red.....℔ ℔, 2 ¢
" " Brown.....℔ ℔, 1½¢
" " Purple.....℔ ℔, 2½¢
" Ground in oil, B. Red℔ ℔, 6½¢
" Ground in oil, Red..℔ ℔, 6½¢
" Ground in oil, Brown℔ ℔, 5½¢
" Ground in oil, Purple℔ ℔, 6
Linseed Oil, Boiled, in nls.....50¢
Linseed Oil, Raw, in bbls.....47¢
Mineral Paints.....2@4¢
Orange Mineral.....9½¢
Pure White Lead in Oil.....6@6½¢
Dry White Lead in bbls.....5½@5¾¢
Red Lead, American.....6@6½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls., ℔ gal...34¢
Spirits Turpentine, in bbls., ℔ gal..34½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, MAY 4, 1894

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:
Small lots.....℔ ℔, 75¢
100-℔ lots.....℔ ℔, 73¢
Ton lots.....℔ ℔, 70¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....℔ ℔, 65¢
100-℔ lots.....℔ ℔, 60¢
Ton lots.....℔ ℔, 55¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....℔ ℔, 60¢
100-℔ lots.....℔ ℔, 55¢
Ton lots.....℔ ℔, 50¢

Antimony—

Cookson.....℔ ℔, 10½¢
Hallett's.....℔ ℔, 9½¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.
¾ in. up to 2 in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝-in.	.38
⅜-in. up to ½-in.	.41
5-16-in. up to ⅜ in.	.48
¼ in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3 in. and larger.	Special
2½ in. to 3 in., to No. 19, inclusive,	.38

15 @ 30%

Copper and Bronze Tubing—8¢ ℔ ℔ more than brass.

Conductors—

Corrugated. *Round or Square*—
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

*Bottoms, Pits and Flats..*12¢ ℔ ℔, net
Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10 ¢
Ansonia Grade Casting.....9¼¢
Planished.....net
Sheet and Bolt.....15¢ ℔ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2.50	2.80¢
Nos. 17 to 21	℔ ℔, 2.60	2.90¢
Nos. 22 to 24	℔ ℔, 2.70	3.00¢
Nos. 25 and 26	℔ ℔, 2.80	3.10¢
No. 27	℔ ℔, 2.90	3.20¢
No. 28	℔ ℔, 2.95	3.30¢

American B. B.....℔ ℔, 4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11½@12¾¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢ 5%
Craig Polished Sheet Steel.....℔ ℔ 8½¢

Galvanized.

	B. B
Nos. 10 to 16	75@75&10%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....3¾¢@4¢
Bar.....4½¢
Pipe.....5½¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....87½¢, 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2¾¢ ℔ ℔.

Metal Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls.	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil:	
Raw, ℔ gal	.. @ .40
Boiled	.. @ .43
Spirits Turpentine:	
In bbls	.. @ .32
Putty:	
In barrels and ½ bbls	.01⅜ @ .01¾
In tubs	.01⅝ @ .01¾
In tin cans	.01½ @ .02¼
In bladders	.01⅞ @ .02¼

Roofing Material, &c.:

Asphaltum, Trinidad Refined, ℔ ton.....$30.00@$35.00
Asphaltum, Rock, ℔ ton.....$14.00
Coal Tar Felt, 1 Ply, ℔ ℔.....2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft. $1.85
Roofing Pitch, ℔ bbl.....$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, Inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....₩ bbl. $1.23@$1.25
Rosin, E. & F.....₩ bbl. $1.30@$1.50
Rosin, G. & H.....₩ bbl. $1.70@$2.00
Rosin, I. & K.....₩ bbl. $2.30@$2.60
Rosin, M. & N.....₩ bbl $2.90@$3.00

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:

Best Bangor, ₩ sqr	$3.25@$4.50
Pen Argyle, ₩ sqr	3.50@ 4.25
Peach Bottom, ₩ sqr	5.00@ 6.25
No. 1 Chapman, ₩ sqr	4.00@ 4.65
Lehigh Slates, ₩ sqr	3.00@ 4.50

Vermont:

Sea Green, ₩ sqr	2.70@ 3.20
Purple, ₩ sqr	3.50@ 4.50
Unfading Green, ₩ sqr	3.50@ 4.00
Red, ₩ sqr	9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ¼..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs, about 55 lb, ₩ lb.....4¢

Yager's Soldering Salts.
¼-lb bottles, each.....30¢
Large quantities, per lb.....40¢

Spelter—

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Sanca, pigs, ₩ lb.....21¾¢
Straits, pigs, ₩ lb.....21¢ @ 21¼¢
Straits in bars, ₩ lb.....22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.....$7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20.....6.12
" IX, 14 x 20.....6.38
Apollo Roofing, IC, 14 x 20.....5.50
" IX, 14 x 20.....6.50
Atlantic, IC, 14 x 20.....5.75
Bonus, Extra Coated, IC, 14 x 20...6.75
" " " IX, 14 x 20....8.25
Buckeye, IC, 14 x 20.....7.00
" IX, 14 x 20.....8.25
Chicago, IC, 20 x 28.....11.50
Central, IC, 14 x 20.....5.87½
Climax, IC, 14 x 20.....5.50
Columbia, IC, 14 x 20.....7.00
Dane, IC, 14 x 20.....5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20.....5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28.....15.00
Empire, IC, 14 x 20.....5.75
Extra Central, IC, 14 x 20.....5.62½
Flag, IC, 14 x 20.....5.25
Fort Pitt, IC, 20 x 28.....11.00
Globe, IC, 14 x 20.....5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.12½
Juno, IC, 14 x 20.....5.75
Kensington, IC, 14 x 20.....6.75
" IX, 14 x 20.....8.00
Knoxall, IC, 14 x 20.....6.00
Laufman's Apollo (Resquared), IC, 14 x 20.....8.12
Laufman's Apollo (Resquared), IX, 14 x 20.....9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20.....6.25
Lula, Best Charcoal, IC, 20 x 28.....12.50
" " " IX, 20 x 28.....16.00
Manhattan, IC, 14 x 20.....7.00
Maple, IC, 14 x 20.....6.50
Merchant's Roofing (Resquared), IC, 14 x 20.....8.25
McKinley, IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00

Newcastle Real Old Method, IC, 14 x 20. 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20.....6.00
" IX, 14 x 20.....7.25
N. F. Old Style, IC, 14 x 20.....7.50
" " " IX, 14 x 20.....9.00
Old Colony, IC, 14 x 20.....8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20.....5.25
Palacio, IC, 14 x 20.....5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20.....8.00
Phœnix, IC, 14 x 20.....5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20.....9.25
Scott's Extra Coated (Resquared), IX, 14 x 20.....10.75
Taylor Old Style (Resquared), IC, 14 x 20.....9.25
Taylor Roofing, IC, 14 x 20.....8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.....6.62
" IX " 14 x 20.....7.88
U. S. Monongahela, IC, 14 x 20.....6.10
U. S. Redipped, IC, 14 x 20.....8.25
Venus, IC, 14 x 20.....5.37½
Vigilant, IC, 14 x 20.....5.50
Waldo Redipped, IC, 14 x 20.....6.75
Westmoreland, IC, 14 x 20.....6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20.....6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20.....6.00
" IX, 14 x 20.....7.50
Florence, IC, 14x20.....6.75
Hazel, IC, 14x20.....5.80
Iowa, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Linden, IC, 14x20.....6.50
Merchant's Redipped, IC, 14x20.....11.00
Merlon, IC, 14x20.....6.75
Mint, IC, 14x20.....6.00
Newcastle Russia, IC, 14 x 20.....7.00
" " IX, 14 x 20.....9.00
Newcastle Juniati, IC, 14 x 20.....0.50
" " IX, 14 x 20.....8.50
Newcastle Best Coke, IC, 14 x 20....6.00
" " IX, 14 x 20....7.25
Newcastle Coke, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.75
Palma Xtra, IC, 14x20.....7.25
Phœnix, IC, 14x20.....6.25
" IX, 14x20.....7.75
Royal, Extra, IC, 14x20.....7.00
U. S., IC, 14x20.....7.25
Versailles, IC, 14 x 20.....5.75
Youghiogheny, IC, 14 x 20....6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20.....$7.56
20 x 28.....15.00
IX, 14 x 20.....8.75
20 x 28.....17.50
Pontymister Grade, IC, 14 x 20.....6.50
20 x 28.....13.00
IX, 14 x 20.....7.50
20 x 28.....15.00

Worcester Grade, IC, 14 x 20.....5.75
20 x 28.....11.50
IX, 14 x 20.....6.75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20.....$5.37½
20 x 28.....10.70
IX, 14 x 20.....6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20.....5.25
20 x 28.....10.50
IX, 14 x 20.....6.40
20 x 28.....12.80

Imported Bright Plates—

Charcoal.

Duty: 2.2¢ ₩ lb.

Melyn and Caland Grade.	IC, 10 x 14	$6.37½
" "	IC, 12 x 12	6.62½
" "	IC, 14 x 20	6.37½
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.87½
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
" "	DC, 12½ x 17	5.50
" "	DX, 12½ x 17	6.50

Coke.

Steel Coke.—IC, 10x14, 14x20$5.25@$5.35
10x20.....8.12½
20x28.....11.00
IX, 10x14, 14x20.....6.60
B. V. Grade.—IC, 10x14, 14x20.....5.40

Imported Boiler Plates

IXX, 14x26..(112 sheets).....$13.85
IXX, 14x28..(112 sheets).....14.60
IXX, 14x31..(112 sheets).....16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz... $15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz....18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.....52½&10&5%
1½ and over, Plain.....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 1892..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 lb casks.....₩ lb 4½¢
Per lb.....5¢ @ 5¼¢

It Is Reported—

California.

That Fred. Barcoft's Hardware store at MADERA was destroyed by fire on the 20th ult.

Illinois.

That Charles Weber of MILLINGTON is erecting a two-story building which, on completion, will be occupied by his Hardware business.

That Willis & Bender, at LEE CENTER, have disposed of their Hardware store to Harvey Hulbert, who will continue the business at the old stand.

That the store of William Houseworth, MASON CITY, is now being conducted by Paul Enlows, who has purchased the business.

Indiana.

That Sumner & Heffner's Hardware store, at HILLSBORO, was entered by thieves on the 19th ult., but little of value was secured.

Iowa.

That Charles Betler is considering the advisability of opening a Hardware store at PRAIRIE CITY.

Kansas.

That J. C. Guinn, GREAT BEND, has disposed of his stock of Hardware to I. N. Woodward.

That George Smies has purchased an interest in the Hardware business of Keener Bros., CLAY CENTER, and hereafter the firm will be known as the Keener Bros. Hardware Company.

Massachusetts.

That in a large fire at MARLBORO on the 25th ult., the store of W. H. Hill suffered damage to the extent of $2500.

That E. A. Buck & Co., dealers in Hardware, &c., PALMER, are to move into larger quarters about July 1.

That J. R. Todd & Co., WARREN, who recently purchased the Stove and Tin store of W. A. Putnam, have given up the business and removed to Natick.

That a two-story storehouse is being built at NORTH ADAMS, which on completion will be occupied by J. M. Darby.

Michigan.

That Jilbert & Lang have opened their new Hardware store at HOUGHTON. A tin shop will be run in connection with the store. Mr. Jilbert will manage the business. He was formerly connected with the firm of Mondlock & Yagle of HANCOCK and also with J. Pearce at DOLLAR BAY.

That the store of the Phillips Hardware Company, at BLISSFIELD, was burned out on the 23d ult. The loss is estimated at $1500.

Minnesota.

That thieves entered K. Anderson's Hardware store, at LAKE BENTON, on the 18th ult., and carried off a small quantity of Firearms and Knives.

That James Becker has purchased the Hardware stock of Wm. Thoman of HOKAH.

That a partnership has been formed between C. A. Smart and Frank Butler in the Hardware business at AUSTIN.

That the Hardware firm of Clark & James, at ORTONVILLE, have dissolved. Mr. James will continue.

That Mr. Johnson, in the Hardware business at WYKOFF, has sold out to Mr. Boyer of FOUNTAIN.

That Phelps & Co. have succeeded Byron D. Wilson, Hardware merchant, at EXCELSIOR.

That the Martin Company, Hardware merchants, YOUNG AMERICA, are going out of business.

That Heogh & Qually are successors to Charles Heogh at SPRING GROVE.

That Lord & Pokornosky are conducting the business formerly carried on by Jno. Pokornosky at SILVER LAKE.

That Bryant & Andrews, Hardware dealers, MONTICELLO, have sold out to M. B. Bryant.

Missouri.

That J. H. Bockhorst, ST. LOUIS, has removed from 1324 Franklin avenue to 1220 Franklin avenue, where he has a much larger and more convenient store.

That E. Bueltman, ST. LOUIS, has repurchased his old Hardware and House Furnishing Goods store located at Fifteenth and Monroe streets.

Montana.

That the Bee Hive Hardware Company of DILLON have sold out to G. W. Dart.

Nebraska.

That Harrington Bros. Hardware store, at PAWNEE CITY, was burglarized of $60 worth of goods on the 16th ult.

That Taylor Bros. of MINDEN have opened a new Hardware store at TRUMBULL.

New York.

That George S. Pierson & Son of CORNING have disposed of their Hardware store to James Kiff of COVINGTON.

North Dakota.

That F. C. Walter, dealer in Hardware at MINTO, is disposing of his business.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, May 12, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Natural Gas Consumption.

The annual report of Special Agent Joseph D. Weeks of the United States Geological Survey for the year 1893 discloses the fact of the growing confinement of the consumption of natural gas to domestic use. The only State in which the use of natural gas for manufacturing purposes increased last year is Indiana. This State contains by far the most important gas field, its estimated area of productive gas territory being about 2500 square miles. Moreover, while the supply falls far below the demand in other gas fields, it is stated to be well maintained in Indiana, and supplies are even obtained from thence by factories in other gas territories. The value of the product consumed in Indiana in 1893 was $5,718,000, against $4,716,000 in 1892. The total value of natural gas consumed in all parts of the country last year was $14,346,250, as compared with $14,800,714 in 1892. This decrease is attributed to the higher prices charged for the gas in 1893. The falling off in value of the gas consumed has been steady since 1888—the banner year—when $22,629,875 worth of the fuel was used. Of this output Pennsylvania alone produced the value of $19,282,375. Last year the output of that State had sunk to $6,488,000, and all the other States, except Indiana, showed a like decline.

The Spread of Sanitary Legislation.

The wave of sanitary legislation that is sweeping over the United States is a most encouraging and excellent sign of the times. A few years ago it would not have been thought possible that so many cities would so soon have adopted measures regulating the plumbing and sanitation of houses. Of course, there have been rules governing this work in the principal cities for some years past, and it is not to the spread of such laws among the cities of the first magnitude that we allude. It is the permeation of the spirit of sanitary reform into the small cities and towns throughout the entire country that awakens surprise and admiration. In fact, so general has been the adoption of laws of this sort that it has been almost impossible to keep track of the places that have followed in this line of reform. It is natural to ask the cause of this sanitary revolution which has been so wide sweeping, and we think it will be generally admitted that the body largely responsible for the good work is the Master Plumbers' Association of the United States, acting upon legislators through the various local associations. For this work they cannot be too highly praised; and it is evident that, with the still further spread of the organization among smaller towns and remoter parts of the country, there will be a corresponding spread of sanitary legislation that will conduce to the health, happiness and material welfare of all people. If the Master Plumbers' Association should come to an end to-morrow it would not have existed in vain, for the impetus that has been given to reform along this line would be felt for years to come. The association, however, is too robust and great a body to fear any sudden death; and we believe that with its growing strength it will increase in usefulness in this as well as in other work.

Sensible Stove Manufacturers.

The stove manufacturers conduct their business very differently from their colleagues in other branches of the iron trade. While prices generally have been not merely reduced but savagely cut until not a semblance of profit can be detected in most staple articles of iron and steel, the manufacturers of stoves have refused to be stampeded and have maintained their schedules. They have seen the demand for their goods shrink steadily 10, 20 and even 30 or more per cent. below their customary volume of business, but have not sought to stimulate the drooping trade by offering stoves at lower and lower prices. In recent years margins of profit have been very slight, owing to increasing competition, and it would have been supposed that the competition for business would be more severe than ever when trade fell off. Yet this was not the case. Conservatism and philosophy ruled in the councils of the stovemen instead of blind frenzy and a rash desire to keep selling. When they found their warehouses getting uncomfortably full of stoves which could not be sold they shut down their foundries and waited for trade to improve. From time to time, as their stocks were drawn upon by the requirements of the trade, they resumed work in the foundries.

Wages Maintained.

Thus has the stove business gone forward, not by any means to the satisfaction of the makers, but with far less friction than in many other lines. Workmen employed in the foundries have not struck because they had no incentive to strike, as their wages were not reduced nor has a reduction been even threatened. Stocks of stoves in dealers' hands have suffered no depreciation in value through the action of the manufacturers, which can hardly be said of any other goods carried by them. The fact seems to have been universally recognized that stoves are cheap enough and sold at figures sufficiently close, so that reductions in price if made would not have enlarged the consumption. It is doubtful if a single consumer who needed a stove during this panicky period made an argument for a lower price based on the decline in other goods. In fact, the reductions in prices on such goods have not been made to any extent in compliance with the views of consumers, but have almost wholly been brought about by the action of the manufacturers themselves. The stove manufacturers propose to continue this policy. At their recent convention in Chicago they passed a resolution that in view of the decreased demand for stoves and the maintenance of the old scale of wages paid their workmen, which had materially enhanced the cost of production, making the selling price so nearly approach the cost, a rigid adherence was obviously required to existing prices and terms, and that it was the sense of the convention that such prices and terms should be firmly maintained during the year 1894. The manufacturers are undoubtedly of the opinion that the depression in business is only temporary, and they seek to prevent a demoralization in their trade and disaffection among their workmen which might not only lead to serious consequences now, but be felt injuriously for some time after the depression passes away.

Prices Maintained.

It is worthy of note in this connection that the stove manufacturers have been able to maintain their prices without the formation of a trust or a combination, or even the semblance of one. They have two national associations, one for defense in case of labor troubles and the other for the mutual interchange of ideas on subjects connected with their business as manufacturers. Neither of these, however, regulates prices. And yet, with no machinery whatever in operation to bolster up one another, they maintain their rates against adverse circumstances which have wrecked combinations of almost every kind. They are a shining example for other manufacturers who have steadily parted with every advantage given them in reducing costs, as if they were in business only for the benefit of the dealer and the consumer.

THE LETTER BOX.

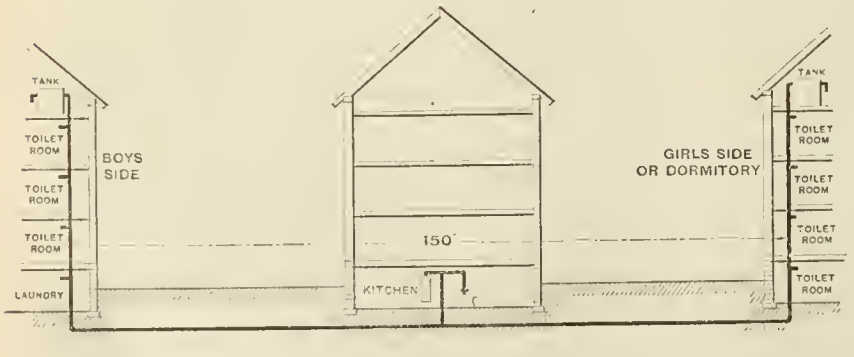
Expanding Liquid.

From C. W., *Winnipeg, Man.*—Will *The Metal Worker* or some of its readers inform me of a liquid that will not harm metals which will contract considerably between 34° and 32° above zero?

Answer.—Our correspondent is probably familiar with the peculiar properties of water, whose point of maximum density is about 39° F. From there to the point of freezing, as the temperature falls, the liquid expands. Water, however, is the only fluid that has a point of maximum density higher than the freezing point. The liquid most suitable to our correspondent's needs is, we think, alcohol, which is one of the most expandible of common fluids. Between 32° and 212° F. its volume increases about one-ninth; under the same conditions mercury expands one sixty-fifth of its volume. Nitric acid has the same percentage of increase as alcohol, namely, one ninth, but, of course, it would be inapplicable to our correspondent's use, on account of its corrosive effect on metals. Our correspondent will realize that if he wishes to make the fluid visible it is easy to color it.

Erratic Water Supply.

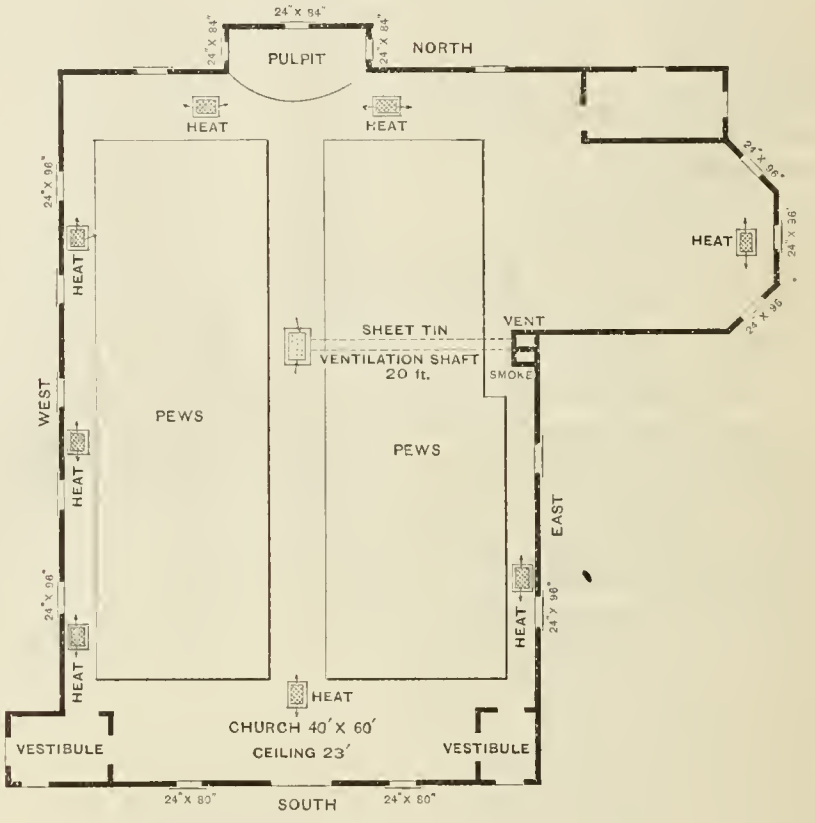
From G. E. S., *East Stroudsburg, Pa*—I have frequently noticed the trouble that is reported with the flow of water through pipe in different parts of the country, and I now have a mystery on hand which I cannot explain. The sketch shows two different buildings which are supplied with water from the street main. There is a 1000 gallon tank in the upper part of each of the buildings, which are 150 feet apart and connected with a 2-inch supply pipe to which is attached a float valve. When the supply to the tank in the boys' dormitory is closed we have no trouble to draw all the water needed in the laundry and all the toilet rooms, but when the water is closed off in the dormitory on the girls' side there is trouble to get a flow of water in the tank on the boys' side, the supply barely reaching the third story. There is much more water used in the laundry than in any of the other buildings. This experience shows that the water flows much more easily to one dormitory than it does to the other, yet when the school was first opened it worked equally well on either side. I shou'd like to have the readers express their opinion as to what makes the trouble.



Erratic Water Supply.

Wants a Better System.

From W. S. G., *Penbrook, Pa*—I send herewith the drawings for a church that is to be built in this town. The church in question is 40 x 60 feet with ceiling 23 feet high, built of brick and stone with all sides exposed and on a slight elevation of ground facing south. The architect has made a few marks relative to location of registers, &c., on the floor plan as a guide for the heating



Wants a Better System.

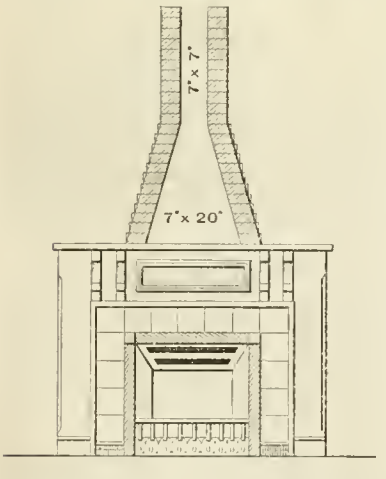
engineer of what he calls a practical system of ventilation. His theory is that the hot air will rise at the outer edge of the room and concentrate at the ventilating register, which is in the center of the room, drive out the cold and stagnant air through the vent shaft, which is almost as cold as icy Greenland, and furthermore the draft of the shaft will also assist in carrying off the cold air. The furnaces take the fresh air from the cellar, which is a grand feature, as church cellars, generally speaking, are in a haphazard condition, containing an accumulation of ashes and other refuse which laden the air with impurities which are taken into the furnace, thence into the church room and into the lungs of the occupants, causing more or less distress. If the furnaces, are put in according to this plan the result would be a warm ceiling and a cold floor, with a large percentage of loss of heat through friction and radiation in the cellar. There would be no circulation of air which is essential to perfect heating. Another barrier to the perfect operation of the furnaces is the chimney, which is lower than the ridge of the roof, causing rebounding currents of air to take place at intervals, a detriment to the working of the furnace. My plan would be to pour the heat into the room in an

undivided volume, and so maintain its power and quicken the ascent to the room above with less loss of heat through friction and radiation. Now I want some of the practical readers of *The Metal Worker* to give me a plan to heat this church in a satisfactory manner under existing circumstances by hot air without respect to the architect's or my opinion.

Note.—We hope this correspondent will not be disappointed in his appeal for assistance. It would seem that as the ventilating shaft is warmed on one side by the smoke flue there would be a tendency for upward currents in it. Many churches are heated with air taken from the cellar, but it has been suggested that an arrangement for taking the air from either the church or out of doors at will has advantages. Some authorities agree with our correspondent that it is better to have one large register over the furnace than to have several scattered registers. Here is an opportunity for giving a rule for determining the size of register, ventilating shaft and air supply, as well as suggesting a method of heating.

Fire Place Smokes.

From J. A. S., *Fairfield, Iowa.*—I was much interested in the article on the proportion of fire places in *The Metal Worker* of April 7. It is a fact that half of the grates in this town smoke, and some of them that have the smallest flues work the best, so that I think it is not so much the size of the flue as the way the grate is connected to the flue and the shape of the flue at the grate connection that causes the trouble. The question is, How ought the grate to be connected with the flue and what should be the size of the opening that leads to the flue to make a good draft for soft coal or wood? For an ordinary sized fire place which has a front opening 24 x 30 or 30 x 30 inches, what is the best proportion or



Fire Place Smokes.—Fig. 1.—Front View Showing Flue.

shape for the opening to the flue? Should the opening be over the front or the back part of the grate? I inclose a drawing of a grate that is located in the corner of a room which has about 1 foot of space between the back of the grate and the flue. Fig. 1 shows a front view of the grate and the shape of the flue over it. Fig. 2 shows a sectional view of the grate and the opening space behind the grate. This grate smokes when burning either wood or coal, and I would be under obligations to some reader of *The Metal Worker*

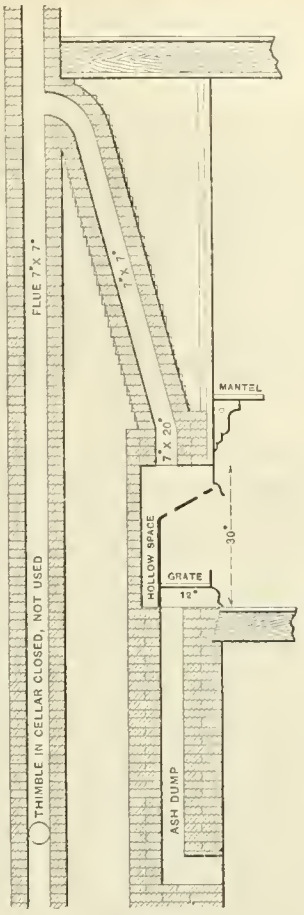


Fig. 2.—Sectional View.

who can suggest a way to make it work well without smoking. As will be seen by the sketches, the smoke flue is 7 x 7, and at the top of the grate it is 7 x 20 and gradually tapers into the flue above.

Machine or Tool?

From M. J. C., *Elwood, Ind.*—Will the readers of *The Metal Worker* please state whether a lathe should be classed under the head of tool or machine in the stock account of a foundry and machine shop? The question has been raised in our office, and some think that the lathe should be considered under the head of a tool, claiming that it is a machine tool, and for that reason should be called a tool.

Note—As this question is an interesting one, we hope to receive reports of the custom observed in different offices on the classification of this fixture in their plants.

How He Uses His Paper.

From C. E. S., *Clinton, Iowa.*—I have read *The Metal Worker* with great interest for a number of years, and as the copies do not come fast enough I frequently read much of the valuable matter they contain a second time, particularly during the winter months. As a result of my reading I have devised the following method of preserving them. I separate the advertising pages from the reading matter and bind six months of the reading matter together, as a larger volume is inconvenient to handle, and in this way it is ready for reference. I then sort the advertisements, preserving one of every advertisement that has appeared, and bind this as a separate volume, which makes a most excellent buying directory. I would advise others to follow this plan, as they will find it very useful, and they can readily do it themselves. To me the Letter Box is a very interesting feature, and I use it as a sort of civil service examination, reading every question and preparing a satisfactory answer, at least to myself, and whenever I am unable to answer a question I make it a point to seek for the information until I find it.

Centennial Flat Iron Heater.

From W. H. HESS, *Lanark, Ill.*—Will some reader of *The Metal Worker* furnish me the address of the manufacturers or sales agent of the "Centennial Flat Iron Heater," a round heater made to set in a single lid opening of an ordinary cook stove? The heater has a pair of sliding covers that close automatically when the iron is placed in the heater. No manufacturer's name appears on the heater, but it is marked "Patent Allowed 1876." I am anxious to obtain this information and will be much indebted to any one who can furnish it.

The World's Fair Buildings.

The Columbian Exposition Salvage Company, with a capital of $200,000, have purchased the 20 World's Fair buildings, which are all the buildings that the Park Commissioners had in their possession, with exception of La Rabida Convent and the Forestry Building, for the sum of $80,000. This gives them a working capital of $120,000 after paying for the buildings. The company consist of the following scrap iron and scrap metal merchants: August Pollak, North Western Iron & Metal Company of Chicago, Ill., A. S. Deutsch & Co., of Chicago and Cleveland, and Ohio Iron & Metal Company of Cleveland, Ohio, and the Chicago House Wrecking Company of Chicago, and Sievers & Fearnly of Cincinnati, Ohio, who are experts in the business of dismantling houses and buildings and also large dealers in the lumber trade. It is expected that work will begin within a few days. The end of this season will see the White City pretty well dismantled. All the structural material will be taken down very carefully, and the company are prepared to sell to railroad companies, factories and others who contemplate erecting buildings any quantity of such material in the iron and lumber structural line that they desire.

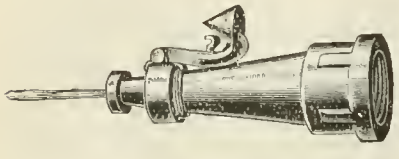
Returns of the mineral production of Canada for the year 1893 have just been issued. They show an aggregate value of $19,250,000, or $250,000 less than that of 1892. Nickel heads the list of metals, the output being 3,992,982 tons, valued at $2,078,351. Gold was produced of the value of $927,244; copper, $875,864, and silver, $321,423. The coal mined was 3,000,700 tons, valued at $8 422,259; iron ore is placed at 124,702 tons, valued at $298,018.

The new wheat crop of the Argentine Republic is said to be an abundant one. It is expected that the surplus available for export will be largely in excess of the exportation last year, which amounted to over 1,000,000 tons. The wool clip is also said to be heavy.

THE RETAIL STORE.

Spray Nozzle.

We show in the accompanying illustrations a spray nozzle made by the Ette & Henger Mfg. Company, St. Louis, Mo. Fig. 1 shows the nozzle throwing a solid stream, while Fig. 2 shows it



Spray Nozzle.—Fig. 1—View of Nozzle Throwing Solid Stream.

with the spray attachment. One of the special features to which the manufacturers direct attention is that it has no joints or packing to wear out or leak. The spray attachment, which it will be noticed is hinged, and may be thrown forward in front of the stream, will

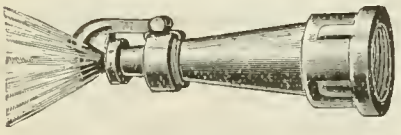
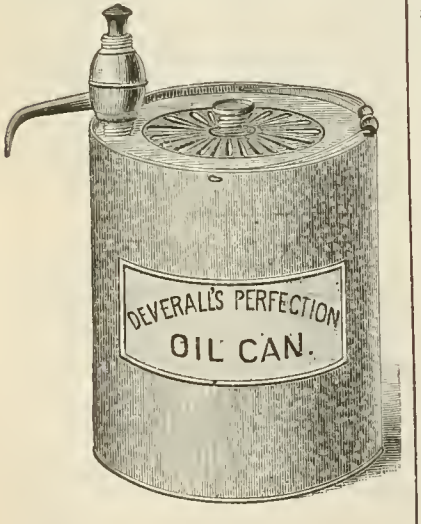


Fig. 2.—View of Nozzle Throwing Spray.

permit of a spray as fine as mist, or will close off the pressure entirely, acting as a cock. The nozzle is made in two sizes, ¾ and 1 inch, both brass and nickel plated.

The Perfection 5-Gallon Can.

Deverall Perfection Mfg. Company, 36-38 Bridge street, Brooklyn, N. Y., are offering 5-gallon oil cans, an illustration of which is given herewith.



The Perfection 5-Gallon Can.

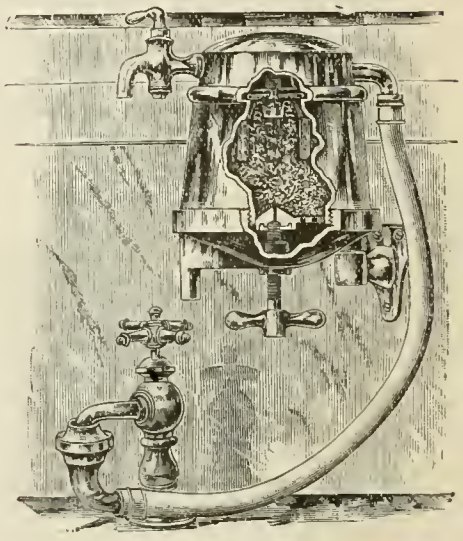
The can is made of No. 28 galvanized iron, with a stamped bottom set up ½ inch and a corrugated tin top. The pump is removable for shipping or when sending the can to be refilled, and is made so that the spout may be swung over the top when not in use. The manufacturers claim that the can has a strongly constructed bottom and top to withstand hard usage; that the can may be perfectly sealed for transportation when filled; that the pump thoroughly vents the can, insuring a perfect flow, and that the pump is simple and strong, provided with anti-corrosive valves. It is stated that the can is well constructed and thoroughly soldered.

Pure Water-Pure Food Filter.

The accompanying illustration shows a filter which the Coles Mfg. Company of Philadelphia are putting on the market. In construction it consists of a brass or iron cylinder with a removable bottom having a discharge nozzle. Three perforated tubes are attached to a plate or diaphragm fitting into a recess or roll around the upper part of the cylinder, through which the water is carried to the center of the filtering material. Another perforated plate or diaphragm fits loosely in the lower rim of the cylinder, and is raised or lowered by a T handle screw passing through the removable bottom. A faucet is placed in the upper part of the cylinder in order that unfiltered water may be drawn when required. Water is supplied to the filter by means of a rubber hose connected to a supply nozzle in the head of the filter and attaching to a supply faucet by means of a special coupling containing a rubber washer with a small hole in its center which allows of a tight connection being made with the nozzle of any ordinary compression or basin cock or spigot. The filtering material used is a cotton pulp which is designed to absorb the sediments, impurities, and coloring matter contained in the water passing through it, and allows the water to pass out through the discharge in a steady stream, it is stated, of 25 to 30 gallons capacity per hour in the smallest size of the filter.

Filtered water is discharged from the outlet at the bottom of the filter, at the left hand side, as shown. By turning the supply faucet with which the filter is connected an immediate flow of filtered water is obtained. When the pulp becomes impregnated with foreign matter, it is taken out of the filter, washed in the same manner as a piece of cotton cloth and replaced. In this way the pulp may be used over and over again without renewal. In the smallest size of the filter it is claimed that from 400 to 800 gallons of water may be filtered without cleansing the pulp. The filter is affixed to a wall or wood work by a bracket which enters a socket in the cylinder bottom, and thus allows of easy removal when required. Adjustment of the filter to the water pressure is obtained by raising or lowering the bottom plate by means of the screw until the pulp presents the necessary compactness to secure thorough filtration with a quick supply. The heavier the water pressure the greater the compactness of pulp required.

The filter is made in two sizes. The cut shows the larger size, made of brass, polished and nickel plated, or of tinned cast iron. The smaller size of filter is made entirely of tinned cast iron, for kitchen or common use, without facilities for securing unfiltered water other than by removal of the filter tube. The filter is also made of special form for permanent attachment. The makers claim that the filter embodies the following advantages: Indestructible filtering material capable of being easily and thoroughly cleansed; thorough and rapid filtration, with little diminution in delivery, and adaptability to any pressure.



Pure Water-Pure Food Filter.

MEMORANDA.

The firm of C. Seybold & Son, Jeannette, Pa., have been succeeded by Nesbitt & Bro., who will carry on the business of dealing in stoves, tinware, &c. Messrs. Seybold are going into the lumber business in Randolph County, W. Va.

Ziegler & Queary and W. W. Prather of Manchester, Ohio, have consolidated and will remove to Portsmouth, Ohio, where they will do business under the style of the Portsmouth Tinware Company as jobbers in tinware, wooden ware, stoves and crockery.

The gold mining industry of Oregon received considerable stimulus last year. It is stated that the gold output for 1893 was nearly $2,000,000, a far larger yield than ever before. Her wheat and woolen interests, however, suffered severely from depression.

The new truck receiving station of the Pennsylvania Railroad, in Jersey City, is of very large dimensions. It is 655 feet long and 92 feet wide. Eighty trucks can unload at once on each side of the platform.

PLUMBING and GAS FITTING.

Plumbers' National Convention.

President Finnerty is sending the following notice to the master plumbers' associations in the different States:

The twelfth annual convention of the National Association of Master Plumbers will convene in Philharmonic Hall, Detroit, Mich., at 10.30 a.m., Tuesday, June 19, 1894, continuing in session for three days. The Cadillac Hotel has been designated as national headquarters. Accommodations can be secured at the above house for from $3 to $4 per day. Accommodations can also be had at the following: Russell House, $2.50 to $3.50; St. Clair Hotel, $2.50 to $3; Normandie Hotel, $2 to $2.50; Wayme Hotel, $2 to $2.50; Barclay Hotel, $2. The above rates are all on the American plan. The houses are all located convenient to Philharmonic Hall, with the first four possessing the advantage in this respect. The Railway Association of Michigan, the Trunk Line Association, the New York & Boston Lines Passenger Committee and the Central Traffic Association have granted excursion rates of a fare and a third on the certificate plan to all delegates and alternates attending the convention, from points within their respective jurisdictions. Each person desiring an excursion rate must purchase a first-class ticket (either limited or unlimited) to Detroit, for which he will pay the regular fare, and upon request the ticket agent will issue a certificate certifying to the purchase of ticket at the regular tariff fare and likewise determining the route via which return ticket will be sold. This certificate must be signed by the ticket agent at the point where the through ticket is purchased, and in the presence of the ticket agent, signed by the purchaser; also, countersigned at the convention by the financial and recording secretary of the National Association of Master Plumbers and viaed by the special agent of the railway association.

Tickets for return journey will be furnished on presentation of the above certificates to the ticket agent at Detroit on payment of one third the regular first-class fare. The return tickets will be furnished only on certificates procured not more than three days before the convention assembles nor later than three days after the convention assembles (June 19), and will be available for continuous passage only, no stop over privileges being allowed on tickets sold at less than regular unlimited fares. The certificates will not be honored unless presented within three days after the adjournment of the convention, Sunday not being reckoned as a day. Certificates are not transferable. No refund of fare can be expected because of failure of parties to obtain certificates and have them properly filled out.

It is to be regretted that the Western Passenger Association has declined to grant a rate of a fare and one-third on the certificate plan; therefore delegates north of the north line of Cook County, Ill, and west of the west line of said county and the Illinois and Mississippi rivers, not including Burlington, Keokuk, Quincy, Hannibal and St. Louis, which cities are in the territory of the Central Traffic Association, will have to pay the regular fare to and from the said cities, but from there they can purchase tickets on the certificate plan as herein described. Delegates from the South outside of the Central Traffic and Trunk Line associations will have to pursue a similar course.

Boston Plumbers and the National Convention.

By addressing National President Daniel G. Finnerty, at 378 Boylston street, Boston, Mass., at an early date arrangements can be made by plumbers along the route to Detroit for joining the Boston delegation. Mr. Finnerty has sent the following to the association in New England, New York, New Jersey and Delaware:

The delegates from Boston and vicinity will leave Boston at 2 o'clock Saturday afternoon, June 16, via Boston & Albany Railroad and New York Central & Hudson River Railroad, arriving in Buffalo at 4 o'clock Sunday morning, and from there proceed to Niagara Falls, where the special train will be side tracked until Sunday noon, thus giving the delegates an excellent opportunity to view the falls. The train will leave Niagara Falls about Sunday noon via Michigan Central Railroad, arriving in Detroit about 9 o'clock Sunday evening. It is hoped that the delegates from the New England States and New York and those who can join the party along the route will do so and stop over with them at Niagara Falls. In order that ample provision may be made for all, it is earnestly requested that those intending to join the Boston delegation and stop over with them at the falls will give notice of their intention as early as possible of the number and where they will join the delegation. The following is a schedule of the train's time at places where delegates can join the delegation:

JUNE 16, 1894.

Train leaves Boston 2.00 p.m.
Train leaves Worcester 3.12 p.m.
Train leaves Palmer 4.17 p.m.
Train leaves Springfield 4.44 p.m.
Train leaves Westfield 5.01 p.m.
Train leaves Pittsfield 6.32 p.m.
Train leaves Chatham 7.16 p.m.
Train leaves Albany 8.10 p.m.
Train leaves Utica 10.35 p.m.
Train leaves Syracuse 12.00 midnight.
Train leaves Rochester 2.10 a.m.
Arrive in Buffalo 4.00 a.m.

The above table is liable to a slight change before June 16. Should such change be made, further notice will be received from this office, or can be had on application to local ticket agents.

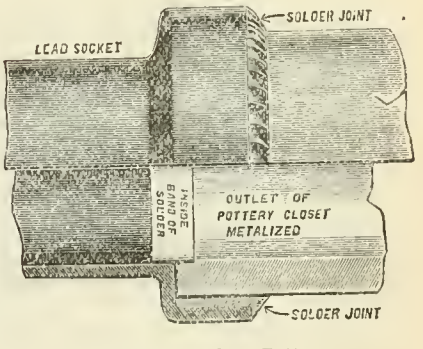
THE ATTENTION of passers by was attracted to the shop of George Franklin, 142 Centre street, New York, last Monday by some quarter bends made of 8-inch pipe from sections 12 feet long. These pipes were for use in a water works system to overcome the friction that would result from the use of the ordinary ells. The bends were very true and smoothly made.

New York Delegates.

Master Plumbers' Association of New York City have elected the following delegates to attend the national convention of the Master Plumbers to be held in Detroit next month: Col. Geo. D. Scott, John Byrns, John Mitchell, H. G. Gabay, H. J. Pattison, Chas Schloesser, Jas. G. Collins, Thos. J. Tuomey, W. M. Young, John Yule, John C. Starck, Wm. Montgomery, M. J. McDermott, E. J. Brady, Jas. Gillroy, Saml. Malcolm, Michael Regan, John McCarren, Jos. W. O'Brien, Frank Reynolds, Timothy Sullivan, Thos. Martin, E. P. Mahoney, Philip Smith, Jas. R. Corbett, Alex. Cameron, Wm. McDermott, Thos. J. Cummings, Adam Huston, Jas. M. Martin, C. Fraser, P. J. Carpenter, J. O. Shumway, Chas. A. Walsh, J. A. Rossman, J. E. Toumey.

Soldering Metal to Pottery.

A new method of connecting lead with porcelain is shown in the engraving below, which is reproduced from



Soldering Metal to Pottery.

London *Engineering*. It has been patented by Doulton & Co., 75a Queen Victoria street, London, E. C. The object of the invention is to get a permanent and tight joint between soil pipes and earthenware plumbing fixtures. The fixtures are made and glazed in the usual way, and the part which is to be connected with the lead pipe is painted over with a metallic solution and then fired. A thin film of metal is thus formed on the surface of the porcelain, and to this the lead pipe can be soldered. It is claimed that the union is perfect; that the lead cannot be removed without tearing the glazed surface of the earthenware, and that the joint is not only air tight, but will resist a strain far greater than it could ever encounter in ordinary usage. The manufacturers state that one was connected with an air pump and tested to 250 pounds on the square inch, a pressure which it sustained perfectly. It is probable, says *Engineering*, that this method of attaching a metal pipe to earthenware will be used for many other purposes besides that for which it has now been introduced, but even should this not be the case, the invention is a very useful one, and will probably supersede red lead and other joints when connecting lead pipes with earthenware.

Massachusetts Master Plumbers.

The Convention of the Massachusetts State Association of Master Plumbers met at Holyoke last Tuesday, nearly 100 delegates attending. A dinner was enjoyed at which Mayor Whitcomb and others were guests. The officers elected for the ensuing year are:

President, W. H. Mitchell, Boston.

Vice-president, J. W. Green, Worcester.

Recording secretary, Daniel Shannon, Boston.

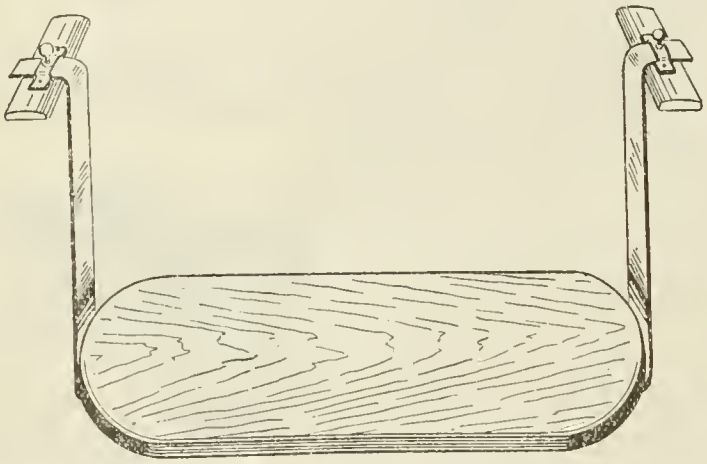
Financial secretary, C. P. Lyman, Holyoke.

Treasurer, E. D. Casey, Holyoke.

Executive committee, J. W. French, Boston; T. J. Clifford, New Bedford; R. E. Fogwell, Fall River; J. F. Davelin, Somerville; O. S. Kendall, Worcester.

Adjustable Bathtub Seat.

St. Louis Bronze & Aluminum Works, 3741–3743 North Broadway, St. Louis, Mo., are offering an adjustable bathtub seat, as shown herewith.



Adjustable Bathtub Seat.

The hanging bar upon which the seat rests is made of polished steel, nickel plated, the clamps are of cast brass, nickel plated, and the seat and bearings of oil finished ash, the bottom of the bearings being covered with rubber so as not to deface the bathtub molding. The seats are also made with the metal work enameled, instead of being finished as described. Other styles are made to order with adjustments on the sides to raise or lower the seat, with a tilting seat board made of any kind of wood desired, or of aluminum or rubber. The seats are designed to fit any style of bathtub and for all kinds of bathing. They are referred to as convenient for foot baths, hip, vapor or sitting baths, and as especially adapted to the use of invalids.

TRAPS AND VENTS.

D. R. Brownlow, plumber, of Middletown, Conn., is placing on the market a new lamp and gas stove with curling iron heater attachment. The stove, we understand, is meeting with an excellent demand from the trade.

"Clean Sweep Non-Syphon Sewer Gas Trap" is the title of a catalogue issued by the Detroit Sanitary Supply Company, Detroit, Mich., sole manufacturers of these devices. The catalogue is addressed to architects, plumbers and all interested in sanitary plumbing, and has been gotten up in a neat and tasteful manner. The Clean Sweep traps are illustrated in all sorts of forms as adapted to lavatories, &c., different forms of traps being illustrated both separately and in connection with fixtures. Brass and lead traps are both shown, and several pages are given to bath wastes and overflows. Basins are shown, and at the close are illustrations of basin plugs. In connection with the illustrations are full price-lists and, where necessary, brief descriptions.

L. M. Barnes of Burlington, Conn., has bought out the plumbing business of the Cowles-Couch Company of Church street, New Britain, Conn. Mr. Barnes is a graduate of the New York Trade School, and has worked several years in Cleveland, Ohio.

The Park & McKay Company, Detroit, Mich., issue a handsome catalogue of the Utopia high grade syphon water closets. The pamphlet, of large size, contains illustrations of the Utopia closets in various finishes and combinations. Altogether, some 24 large pictures of the closet are shown. Full particulars of the finishes and prices of the different combinations are given in connection with the illustrations, while an introductory portion gives a description of the closet, and sectional views show its constructive features and operation.

The annual meeting of the stockholders of the Vanderman Plumbing & Heating Company was held in the office at Willimantic, Conn., on May 2, at which the following directors were chosen: William Vanderman, A. T. Fowler, Dennis Shea, John Riley, E. L. Vanderman. The directors selected A. T. Fowler president, Dennis Shea vice-president, John Riley secretary, Wm. Vanderman treasurer and manager. A 6 per cent. dividend was declared on the capital stock from the earnings of the company during the past year. The amount of business done this year showed a large increase over the preceding year.

The Kelly & Jones Company, Greensburg, Pa., are sending out a circular entitled "Speaking of Air Cocks," showing a weather cock on a building and the air immediately around it filled with air cocks and pet cocks of their manufacture which are provided with wings. On the inner pages, with the statement "Here are a few larger birds of the same feather," they show a variety of the cocks they make. They also make a specialty of recessed fittings for wrought iron drainage systems and issue a small circular showing the different styles of fittings they make, with prices.

The plumbers of San Antonio, Texas, complain because the sanitary regulations of that city are not enforced.

John Bragg, Shelbina, Mo., has bought the business of the Boyd Plumbing Company, at Quincy, Ill., and is now in full charge.

Henry Hauk and Anton Metz have bought out the plumbing business of Edwin C. Mason, at Madison, Wis.

Steadman & Co. have bought the plumbing business of J. W. Skelly & Son, at Bristol, Conn.

John Cremin has been chosen delegate from Pawtucket, R. I., to the national convention of the Master Plumbers' Association of the United States, which occurs next month in Detroit, Mich.

The special brass work required in many of the new and large buildings which have been in course of completion during the past winter has brought many orders for special plumbing fixtures to James Conity, 256 Pearl street, New York.

W. H. Poole has bought out the plumbing business of W. A. Pierce & Co., 126 Main street, Charlestown, Mass.

Secretary J. A. Barr of the Master Plumbers' Association of Rochester, N. Y., informs us that the following delegates to the national convention of the master plumbers to be held at Detroit next month were elected at a recent meeting: J. A. Creelman, J. A. Barr and J. Mahar. Alternates: Thomas Connolly, H. Hart and George Dodds. President W. G. Reed will also attend.

George H. Murphy, 31 Hamilton street, Bound Brook, N. J., is circulating in his locality a circular entitled "That New House," calling special attention to the Auburn steam boiler and explaining that a modern house is not fully equipped without a bathroom and a good plumbing system, and that the house is not habitable unless it has a water tight roof.

The Centre street store of the Colwell Lead Company of New York City, dealers in plumbers' supplies, has been recently improved and adorned by the remodeling of the street front. Large plate glass windows have been inserted and the whole exterior of the well-known establishment at No. 63 has had imparted to it a bright and attractive appearance.

A pleasant letter from J. H. Donnelly of Ware, Mass., states that he is still engaged in business in that city, and that the volume of trade has so increased that he has found it necessary to take larger quarters, at 71 Main street. Through some error, the impression has gone abroad in the trade that he has removed and his mail is being sent to other cities, causing him no end of annoyance.

The Miller Iron Company, Providence, R. I., are sending to the trade a circular relating to cast iron tanks made in two sizes—24 x 72 and 24 inches deep and 24 x 60 and 24 inches deep. They are made with an outlet for connecting either iron or lead pipes

and can be furnished with or without an overflow. The company also make a special style of tank legs in various lengths which are arranged to be braced by a rod running the entire length of the tank and secured with lock nuts each side of the leg. The legs are drilled so as to fasten to the floor and are fastened to the tank by tap bolts, lugs being cast on the bottom for this purpose.

THROUGH the kindness of J. B. Sawyer of the Board of Health of Manchester, N. H., we have received a pamphlet with the regulations for the plumbing and drainage of buildings in that city. These regulations are of the modern character and went into effect May 1.

MCELROY & Co. have opened a plumbing and gas fitting establishment at 516 Santa Fé avenue, Pueblo, Col., where they are doing a nice business.

INSPECTOR OF PLUMBING R. S. BEMIS, Providence, R. I., has recently appointed Horace B. Holland as assistant inspector. Mr. Holland has been in the employ of Thomas Phillips & Co. for 20 years, and is highly recommended as a first-class man for the position.

BENJAMIN F. SHAW, Wilmington, Del., has the contract for the plumbing work on the new street railway of the Metropolitan Electrical Company in Reading, Pa.

GEORGE GRUSSING, architect, Chicago, has prepared plans for a residence to be erected at Watertown, N. Y., for Mills Kilby, to cost about $20,000, to be provided with the best of modern plumbing, hot water heating and electric light.

P. D. ARMOUR & Co., Chicago, will erect a large market and barn at 1136 West Madison street. It will be provided with plumbing fixtures and stable fittings.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

AMONG other plumbing contracts secured by G. M. Sinclair, Hoboken, N. J., may be mentioned one for $5000 for the Mayor of that city, and another amounting to $3000 for William Winges of the same place.

ISAAC COFFIN & Co. of Boston, Mass., are placing a No. 210 Richmond hot water heater in the dwelling owned by Rev. Amos Harris, Everett, Mass.

THE RESIDENCE of Francis Jewett, Lowell, Mass., will have a heating plant installed by the H. R. Barker Mfg. Company of Lowell, Mass., who will use a No. 33 Richmond Victor steam heater.

JOHN F. MULVEY has the contract for heating the private residence of Mrs. Susan H. Cook of Woonsocket, R. I., and will use a No. 44 Victor steam heater.

ARCHITECTS W. W. BOYINGTON & Co., Chicago, have prepared plans for a three story flat building to be erected on Flourney street.

ARCHITECT L. G. HALLBERG, Chicago, has plans for a store and apartment house to be erected on the corner of Clark street and Belmont avenue.

JOHN A. SCOLLAY, 74 Myrtle avenue, Brooklyn, N. Y., has taken the contracts for the heating apparatus for the swimming baths of the Twenty sixth Ward Branch of the Brooklyn Y. M. C. A.; the large apartment house of N. Lucken, Brooklyn; the large boarding and livery stables of E. E. Wheeler, Brooklyn; a range of greenhouses for H. Fischer, Great Neck, L. I; four greenhouses for Geo. Kruse, Jersey City; a range of violet houses for A. McKellar, Rockland Park, N. Y.; the private conservatory of the Hon. Theo. Koeler, Long Island City, and also three large steam boilers for the Ogden apartment houses, Brooklyn.

C. S. BARKER will build an apartment house to cost $50,000 at Superior, Wis., which will be heated by steam and have a plumbing system.

THE NEW BOARD OF SUPERVISORS of Warren County, Ill., have appropriated $35,000 for heating, lighting and furnishing the new court house.

CROOK, HORNER & Co. of Baltimore have been awarded the contract for supplying the heating and ventilating apparatus for the United States Post Office building at Staunton, Va., on the firm's bid of $2591.

JAMES H. MACK, Fitchburg, Mass., has been awarded the contract for plumbing the new High School building at that place. The plans call for 81 water closets, 30 lavatories, 8 drinking fountains, 30 urinals, and hydrants on each floor for fire purposes; all piping exposed to be brass, nickel plated.

SEALED PROPOSALS will be received at the office of the custodian of the United States Marine Hospital, New Orleans, La., until May 28, for furnishing a new water supply to the hospital.

THOMAS & RAPP have been engaged to prepare plans for the reconstruction of a school building, recently destroyed by fire, at South Evanston, Ill., for the Board of Education. It will be three stories high, with exterior of buff pressed brick and Bedford stone, and will be heated by steam.

S. S. BEMAN is letting contracts for two school buildings, at Pullman, Ill., for the Pullman Palace Car Company. They will be of various dimensions—one three stories high, built of pressed brick and stone, have slate roofs, hard wood finish, steam heat, gas fixtures and the latest improvements, at a total cost of $80,000.

M. J. DALY, Waterbury, Conn., has been awarded the contract for heating and plumbing the Apothecaries' Hall Company's block. Each room is to be heated and fitted for gas and electric lights, hot and cold water.

BIDS will be received by the authorities of the Western Female High School building, at Baltimore, Md., up to May 16, for two methods of heating and plumbing. Separate bids will be received for a steam plant and a hot air plant, and for a dry closet system and a plumbing system, using water closets, &c.

THE JOHN DAVIS COMPANY, 69 to 79 Michigan street, Chicago, are to install a hot water heating plant in the flat building of Giles Hubbard Indiana avenue and Forty-fourth street.

A. C. HICKEY, 69 South Clinton street, Chicago, has the contract for plumbing, sewerage and gas fitting in the double flat building of Henry Horne & Co., 169 and 171 South Morgan street.

AMONG the contracts recently taken for plumbing, gas fitting and sewerage by E. Baggot, 169 and 171 Adams street, Chicago, can be mentioned the following: Residence of C. J. Blair, Drexel Boulevard and Fiftieth street; factory of Phelps, Dodge & Palmer Company, Twenty-sixth street and Shields avenue; residence of D. B. Jones, Lake Forest, Ill.

CHARLES A. KLIE of Columbus, Ohio, has the contract for the plumbing work and drainage to be done in the new court house to be erected at Toledo, Ohio.

BROOMELL, SCHMIDT & Co., Limited, York, Pa., are using in one of their heating contracts one of the No. 6 hot water boilers made by Thomas Weathered's Sons of New York City.

GEORGE H. MURPHY, Bound Brook, N. J., has just completed the plumbing work in the residence of Mrs. Giles.

GEORGE G. HARGRAVES, Kansas City, Mo., will use a No. 6 hot water boiler made by Thomas Weathered's Sons, New York, for heating a residence in that city.

THE AMERICAN HEATING & CONSTRUCTION COMPANY, 69 Centre street, New York, will install a steam heating plant, using an Economy boiler, in the apartment house of Peter Fuchs, Ninety-fourth street and Madison avenue. They are also running the pipe for the refrigerating plant in the cold storage building of Wills Brothers, 143 Chambers street.

THE BOILERS of the H. B. Smith Company, 133–137 Centre street, New York, will be used for heating the Young Men's Christian Association building at Plainfield, N. J., and the residences of W. T. Campbell, Newark, N. J., and Charles L. Johnson, Ansonia, Conn.

THE SECRETARY of the Treasury has awarded the contract for supplying steam heating and ventilating apparatus for the public building at Danville, Ill., to J. T. Foley & Co. of Evansville, Ind. The contract price is $4790.

SEALED PROPOSALS will be received at the office of the Comptroller, in the Stewart Building, up to May 17 for alterations to the steam heating and ventilation and for the plumbing and gas fitting work in the new Criminal Court House at New York City.

ADDITIONS will be made to School No. 6, Terre Haute, Ind., that will require a heating and ventilation and a plumbing system. The entire work must be completed by August 30.

PROPOSALS will be received up to May 16 for the heating, ventilation, plumbing and gas fitting for a school building in district No. 50, Buffalo, N. Y.

A. F. SPETTEL, La Crosse, Wis., has let the contract for the plumbing work at his studio building to G. J. Egge.

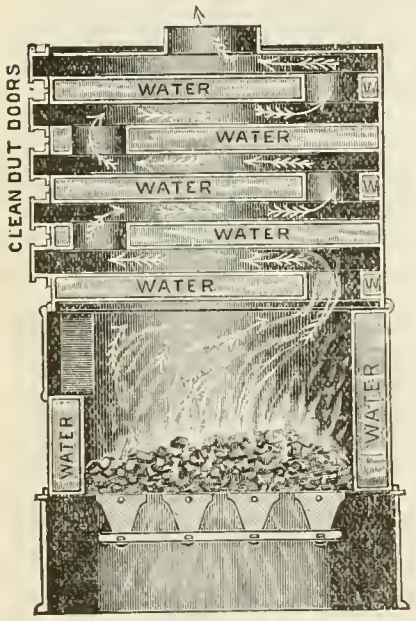
THE entire stock of roofing sheets held by one sheet mill was bought at market prices by a Canton concern, and there is a good demand for all that can be turned out by those mills in operation. The stoppage has become a source of annoyance both to buyers and mill operators, and no relief is expected for at least two weeks to come.

The railway companies have made very large reductions in the staffs of their mechanical departments. This has led to a great decline in the railway demand for heavy metals.

STEAM AND HOT WATER.

The New Lily Hot Water Heater.

Rubel & Co., 75–77 Lake street, Chicago, manufacturers of the Lily line of steel ranges, furnaces, steam and hot water heaters, are introducing the new Lily hot water heater, which is herewith illustrated. The heater is constructed of cast iron, on the circular, sectional principle, by which any section may be readily removed or replaced, and admitting of it being "knocked down" and taken through narrow passages. It is portable, requiring no brick work in setting, and consists of the base, containing the grate frame and grate and forming the ash pit, the fire pot, and from three to five sections placed alternately, and lastly surmounted by the top casting. The grate is self dump-



The New Lily Hot Water Heater.

ing and shaking, anti-clinker, cleanly, the ashes falling into a closed pit. The fire pot is cylindrical in form and of sufficient size to hold a quantity of fuel not necessitating continuous firing or attention. The door for feeding fuel is large, and at such a hight as to admit of fuel being supplied and distributed to any portion of the grate desired. The circulation of the heat is as follows: The hot gases from the fire pot come in contact with its surfaces, impinge against the bottom of the first section, circulate to the rear, and pass through the smoke flue into the expansion chamber, where, expanding, they come in contact with the top surface of the first section and the bottom surface of the second section; then passing forward to and through the flue hole in the second section, which is on the opposite side of the boiler from the first flue hole, as shown in the cut, to the second expansion chamber, and so on successively until they have passed through five expansion chambers and acted upon ten horizontal surfaces.

The return water of circulation is received into and enters the fire pot through two openings at its side and rear, and is circulated around the fire pot to its exit, at the opposite side; there it is conveyed to and through the first section, passing into the several sections directly opposite from where it enters the previous one, and so on alternately from one section to another, until it reaches the top section, where it leaves the heater. To prevent the water in its passage through the rings from going direct from the inlet to the outlet and the water around the sides remaining dead or inactive, circulating plates are introduced by which the water follows a serpentine course through each section. Provision is made for thoroughly cleaning the heater by means of large clean out doors in the front, by which any deposit may be readily and rapidly removed from both bottom and top surface of each section.

HEATING NOTES.

The United States Radiator Company, Dunkirk, N. Y., are a new organization which will carry on the radiator business built up under the name of the Harrell Steam Heating Company. The change is in the name only, the management remaining the same. Some disadvantage has been experienced from the wrong impression given by the old name. The business has grown in the five years of its existence till it taxes the capacity of the large new buildings in which the manufacturing is done. An increasing trade is expected when the new things that are in preparation are put on the market.

J. Henry Smith has retired from the firm of Getchell & Co., Bangor, Maine. Geo. W. Getchell will continue the plumbing and heating business under the same name.

The certificate of incorporation of the Queen City Radiator Company of Buffalo, N. Y., has been filed. Their capital stock is $300,000. The directors are Walter F. Bryant, Orrin Bryant, William H. Harell, Nathaniel N. Hunt and Marcus M. Drake.

"Warmth for Winter Homes" is the attractive title of an attractive pamphlet published by the United States Heater Company of Detroit, Mich. This is a little volume of nearly 100 pages, bound in colored paper, containing within its covers a general treatise on heating, many illustrations of buildings warmed by the several boilers of the United States Heater Company, and at the end a number of testimonial letters, together with illustrations of the boilers.

Dion Geraldine is at the head of a company recently formed at Chicago to abolish the smoke nuisance. Their plan is to take charge of all steam plants in the business district now controlled by the owners. It is said that they will make a contract with a man who has a steam heating plant in his building to run his engines, furnish light, heat and power cheaper than he can do it for himself, and will give a bond to carry out the contract. It is claimed that they can run a large number of small plants cheaper than the owners can operate them singly. By buying fuel in large quantities, putting on the latest devices for consuming smoke and saving coal and operating all the plants with a corps of trained engineers and firemen, they claim that they can effect a neat saving under the cost of running detached plants. Bond is given that the service will be satisfactory and guarantee is given their customers against suits under the smoke ordinance. They are confident that the plan will succeed and that when it is put in operation there will be no more complaint of the smoke nuisance in the business district.

In a trade edition of the Quebec Morning *Chronicle* is an interesting account of the Mechanics' Supply Company, dealers in gas, water, steam and plumbing supplies, &c. Among other firms for whom they are agents are the Toronto Radiator Mfg. Company, Warden, King & Son, Jenkins Brothers, Edward F. Keating, and the Toronto Steel Clad Bath Company.

Edwin C. Mason, Madison, Wis., will make a specialty of the heating business in future, having sold out his interests in all other lines.

The Alexander Iron Works have been recently organized at Alexander, Ind., and in addition to running a general foundry and machine shop, they will make a specialty of wrought iron pipe and pipe fittings, both cast and malleable, and will cut pipe to specification. They will also carry a full line of Lunkenheimer valves.

We are indebted to the Richmond Stove Company, Norwich, Conn., for another batch of illustrated and descriptive catalogues of the Richmond steam and hot water heaters, which they issue in the interest of their agents throughout the country. The firms are J. B. Jackson & Son, Nashua, N. H.; Higgins & Co., 379 Lexington avenue, New York; C. M. Briggs, Athol, Mass.; H. K. Austin, Reading, Mass.; E. G. Kelly, Peabody, R. I.; Barker Brothers, Newport, R. I.

The first catalogue of the Fowler Radiator & Mfg. Company of 435 North Broad street, Philadelphia, Pa., is being issued to the trade. It consists of 12 pages in a dark green cover with gilt lettering, and is devoted to the Fowler radiators, showing cuts of the radiator complete and with ornamental base and cold air dampers. The radiator is also shown set up with a register taking air from outdoors. The last two pages are devoted to giving all the necessary dimensions for both their semi-direct and direct flue radiator for steam or hot water.

President Bond of the American Radiator Company of Chicago was a visitor at the New York office this week.

The J. H. McLain Company, Canton, Ohio, have established a New York office at 69 Centre street, in the charge of D. R. McCallum, well known to the

trade throughout the United States. They are now decorating their show room previous to the arrival of their samples, when they expect to make a display of their different goods, with the Humber hot water apparatus and the Cambridge steam boiler as leaders of the line.

Among the contracts recently taken for steam heating by Rubel & Co., 75 and 77 Lake street, Chicago, can be mentioned the following: 12-flat building, of B. Eisengrath, Center avenue, near Van Buren street; 12-flat building of Mandel Bros., Vernon avenue, near Thirty-fifth street; 12-flat building of Harrison McGinsie, Boule vard place; flat building of H. Burckland, Forty-second place.

H. R. Wilson, architect, Chicago, has planned for Mr. McAdam a two-story residence. to be built on Vincennes avenue, near Forty-ninth street, to be heated by steam.

The American Radiator Company, 94 Centre street, New York, report a carload of radiators sold for shipment to England.

F. B. Townsend, architect, Chicago, has prepared plans for a two-story and attic frame residence, to be erected by J. W. Slayton, at Argyle Park, Ill. It will be finished in hardwood and heated by hot water.

Architects Raeder, Coffin & Crocker, Chicago, have prepared plans for a seven-story wholesale building to be erected at the corner of Franklin and Van Buren streets for A. E. Kent & Son. The interior is to be of mill construction and heated by steam.

A batch of circulars received from D'Este & Seeley Company, 29-33 Haverhill street, Boston, Mass., illustrate and describe a variety of the Curtis steam goods. One relates to the Curtis balanced steam trap, another to the Curtis boiler feed regulator, a third to the Curtis temperature regulator, while a little pamphlet gives descriptions and price-lists of a large number of Curtis specialties, including pressure regulators, return steam traps, &c.

Bement & Co., 226 La Salle street, Chicago, issue a small circular descriptive of the feed pump governor and automatic feed water regulators which they manufacture. A cut is shown of the governor and full description is given of its operation and essential features.

The Sam'l I. Pope Company, heating engineers, have moved their office from 360 Dearborn street, Chicago, to suit 207 Medinah Temple Building, Jackson street and Fifth avenue.

The American Heating & Construction Company are a new business house at 69 Centre street, New York. They will make a specialty of piping for power or heating and for refrigerating work. The company are composed of D. A. Bridge, well known to the trade from his long connection with the John Simmons Company, who will look after the office of the company, and C. D. Smith, formerly with the A. A. Griffing Iron Company, who will look after all outside work.

Alfred Smith, architect, Chicago, has designed a residence for J. W. Janney, to be built at 4729 Greenwood avenue, at a cost of $22,000, to be heated by hot water.

The Metal Worker was favored the past week with a call from C. S. Graves, one of the representatives of the American Boiler Company, 94 Centre street, New York, who reports a gratifying demand for the steam and hot water goods which he has to offer.

Dinwiddle & Newberry, architects, Chicago, have prepared plans for an apartment house to be built by L. G. Wells on Marshfield avenue, near Taylor street, at a cost of $35,000. It will be constructed of Georgia marble, with a red tile roof, and be heated by hot water.

F. Richter & Son, 382 Sixth street, Milwaukee, Wis., have closed a contract for heating a new $10,000 school house at Lancaster, Wis, with their fan system.

W. L. Klewer, architect, Chicago, has prepared plans for a four-story store and flat building to be erected by E. M. Raworth on North Clark street, north of Diversey, at a cost of $36,000. The interior will be divided into 16 apartments of six rooms each and four stores, to be heated by steam.

Gummey, Spering & Company, Philadelphia.

Gummey, Spering & Co. of Philadelphia, importers and manufacturers of tin plates, &c., are moving their offices and the stock formerly carried at 1023 Market street in Philadelphia to more commodious quarters. They will in future occupy the large warehouse in the newly built brick building situate 149-151 North Tenth street in that city, where there are excellent facilities for carrying a large and heavy stock of their well-known goods. The main floor space in their new quarters covers an area 55 x 176 feet, and there is a basement of the same dimensions. Convenient offices have been located on the main floor, and two very large safes installed in them. Behind the offices is an electric elevator built by Morse, Williams & Co. of Philadelphia, having a lifting capacity of 4000 pounds. They propose to carry an immense stock of tin plates, and have already on the floor, grouped according to branda, upward of 2,000,000 pounds of plates. One group of Climax roofing plates alone represents a weight of 250 tons. Other noticeable brands of roofing plates on the floor are Pennsyl Old Method, carrying 45 pounds of coating to the box of 112 sheets; Leominster, extra coated; Waldo, Alderly, Phœnix, Liberty, Eagle, Venus and Flag. Bright plates cover Phœnix, Climax and Mars brands. All these plates are made in the firm's own works at Twenty-sixth street and Washington avenue, Philadelphia. Besides their own productions they carry a large stock of imported brands of plates. They also handle large quantities of black and galvanized sheet iron, plate iron, and a general line of roofers' and metal workers' supplies, metals of all kinds, a complete line of furnace registers in iron, solid brass and bronze, and other goods of a miscellaneous character. With their other warehouse at Swanson and Catherine streets, the new quarters will enable the firm to keep up with the requirements of their increasing business, and allow of the carrying of a much larger stock than heretofore.

Morfa Tin Plate Works, one of the largest in Wales, were closed down this week owing to the depressed condition of the market.

FLASHINGS.

Detroit Conductor Pipe Company, Detroit, Mich., issue a card to the trade announcing that they have designed and built special machinery for the manufacture of corrugated conductor pipe in 10-foot lengths, for which product they claim particular advantages. The ends are said to fit together easily and the pipes are made from any gauge up to No. 24. The firm are now building machines for the manufacture of a line of eave troughs and hangers and will carry an assortment of tinners' supplies.

According to a report on the values of building stone, &c., produced in the United States during 1893, compiled by Dr. W. C. Day of the United States Geological Survey, the slate produced during the year was valued at $2,523,-173, of which $1,472,275 is credited to Pennsylvania. The product of Vermont was valued at $653 572, and of New York, $204,982. The valuation of the product of other States is given as follows: Georgia, $11,250; Maine, $139,-200; Maryland, $37,884; New Jersey, $3653; Utah, $850, and Virginia, $117,347.

Charles E. Eckstein & Co., who make a specialty of wrought iron ornaments, moldings, special shapes in rolled and forged iron, &c., have removed to 45 Vesey street, New York.

The Knisely & Yeldham Roofing Company, 68 to 74 West Monroe street, Chicago, have changed the name of their company to Knisely & Yeldham Company.

In a recent issue of the *Mercantile and Financial Times* is an appreciative notice of the firm of John Galt & Sons, who have just moved into their new offices in the Postal Telegraph Building, at the corner of Murray street and Broadway, New York. The firm are wholesale and retail dealers in all the various kinds of roofing slate in demand at the present time, including Bangor, Lehigh, Chapman, Pennsylvania, Black Vermont, Red, Purple, Sea Green and Unfading Green and also the Monson and Brownville, Maine, slates.

Schaefer & Heimink is the name of a new firm in the tin, slate and metal roofing business at 1363 Third avenue, near Seventy-eighth street, New York.

Bredfield & Resig have opened a tin, copper and sheet iron working shop at 516 Santa Fé avenue, Pueblo, Col.

The American Roofing Company, St. Louis and Cincinnati, report an excellent demand for roofing, siding, &c. They are making several large shipments to Colorado and the Coast, taking advantage of the cut in freight rates. They consider the outlook very encouraging for a continuance of the present demand.

A. W. Cooper & Co., 671 West Lake street, Chicago, are to furnish the red slate roofs, copper cornice, bays, gutters, flashings, &c., for the residence and barn of R. M. Wells, Michigan avenue and Thirty-eighth street; galvanized iron work, slating, tinning and skylights for the apartment building to be erected on the south side of Boulevard place, east of Grand Boulevard, for H. M. Alfonso; galvanized iron cornices, tin shingled tower, &c., for the office building of Phiffer & Fishback, Lamont, Ill.

STOVE TRADE NOTES.

Address of President Dana.

In opening the first session of the twenty-third annual convention of the National Association of Stove Manufacturers, held in Chicago the first week in May, President George D. Dana delivered the following address:

Long established custom has made it necessary that I should address you at this time. It would afford me much pleasure to have the rule changed, but as it has to be, I shall be brief that you may devote the more time to the consideration and discussion of the most excellent papers that have been prepared for you. One of the pleasantest and most instructive features of our conventions has been the interchange of thoughts and experiences that were made in the lobbies of the hotels in which our conventions have been held. This has been both pleasant and instructive, but it has made it difficult to open our meetings promptly at the hours set. Recognizing the value of these informal gatherings in the lobbies, your officers have thought it best to cater to this desire for informal discussion, and that all may have the same opportunity, we shall at the time of the noon adjournment have luncheon served in this room, and we hope that all will remain here and by their presence help us to expedite business.

History of the Stove Trade.

In February, 1872, the stove trade was thought to be in such an alarming condition that a call was made for a meeting of manufacturers, to be held in New York City on March 6, 1872, to consider the situation. At that meeting John S. Perry presided, and, while admitting the poor condition of the trade, he gave facts and figures to show what could reasonably be expected in the future, and said: "In view of these stupendous figures, is there any occasion for undue anxiety, lest any should fail to command a fair share of business?" Time has proved the correctness of his estimates, and verified his predictions. It is remarkable how the history of the stove trade has repeated itself; the conditions existing today are analogous to those of 10 and 20 years ago. I will call your attention to the utterances of your presidents at the meetings in the years following the panics of 1873 and 1884, and let you judge the future by the past.

At the annual meeting in February, 1874, in his address the president says of the business of the previous year: "Our sales were generally satisfactory in amount and the prices well maintained up to the time of the terrible revulsion."

"The prices of the more common qualities of stoves became somewhat unsettled toward the close of the year. But it has been generally remarked that they were better maintained than might have been expected under the trying circumstances, and this was in a great measure due to the influence of the association."

"I venture to say that in no department either of mechanical or commercial industry has there been less suffering than the one which we represent, and we may confidently predict that in the work of recuperation it will be in the front rank."

Again, at the June meeting of 1874 he says: "It is a cause for regret that the general business of the country and of the world is not in a more satisfactory condition. This depression is not confined to our own country, but appears to be equally severe in Great Britain, France, Belgium and other iron producing countries."

"In our present troubles we call loudly upon the Government for aid; the Government is powerless to render any permanent assistance—demand and supply are the only regulators, and they are controlled by a power which is supreme." "After the crisis of 1837, it was not until 1844 or 1845 that any substantial improvement was apparent; after the disaster of 1857 business remained for the most part unsatisfactory until 1863 or 1864." And after reciting all this he shows his hopefulness by asking, "Does any one believe that ten years or six years, or even two, will be required after the panic of 1873 to develop a reasonable prosperity?"

In 1876 President Jewett says: "The stove trade for the past year has necessarily sympathized with the general depression growing out of the financial situation. The trade has, however, been steadily working off its surplus stock." I do not speak of this as a necessarily discouraging fact, but it is one which manufacturers must recognize. The class of men who cherish the theory that there is to be a grand reaction in trade and a recovery in prices are doomed to disappointment. The period of inflation and unhealthy speculation is past, and values are to be adjusted to a different standard. We must accommodate ourselves to the shrinkage which has already taken place, and be content with moderate margins of profit. There is no magic wand in the hands of the President or Congress that can transform the financial situation. The Government, like the stove manufacturer, must practice economy, insist on retrenchment, and labor faithfully to reduce the balance on the wrong side of the ledger. In June of the same year there was no change in the situation, and stove men were looking hopefully forward to a gradual, if not speedy, return of better times. In January, 1878, the stove trade of 1877 was pronounced as more satisfactory than for many previous years, and with reduced stocks on hand and large crops harvested, the stove men took heart, but did not dream of advancing prices; they were conservative, and in 1878 began to reap the reward of economy and patience. The words of President Sard, in June, 1884, are directly applicable at this time. He says: "The general characteristics of the spring trade have been dullness, a disinclination to buy except for the present needs, an absence of excessive anxiety to force the sale of goods, and a larger restriction of production. The smallness of profits at last year's prices served to check any tendency to lower rates, except in cases where goods were undesirable, obsolete or perhaps higher than the general market."

In February of 1885 he says: "The course of general trade during the past year has been unsatisfactory and uncertain; the hopes which were entertained in the early part of the year were not realized. Labor has been dissatisfied and unable to obtain full employment even at lower wages." In June, 1885, he says: "The depression and congestion continue to prevail."

The Business Situation Past and Present.

How very aptly these words will apply to the present condition of our business you can all see. I ask you to compare carefully the business situation then and now, and answer for yourself the question, Why should we now expect an earlier and fuller resumption of business than has been had after preceding financial troubles? After the panic of 1873, it was five years, or not until the fall of 1878, that there was any decided improvement in business. In the fall of 1879 began the boom that made the years of 1880 and 1881 so pleasant and profitable to stove makers. The condition continued up to the spring of 1884, when the failure of Grant & Ward brought on another financial depression, and called a halt in all business enterprises. In the stove trade, as well as in other lines, business was slow to improve and it was not until 1891 and 1892 that we had what could be considered generally good years. In 1893 up to within a few weeks of our last annual meeting the business had been unusually good, but the storm broke and carried away all hope of a prosperous fall trade. With the abundant harvest of last year, there seemed to be no reason why we should not have had a fairly good fall trade. In some localities it was better than in others, but generally it was not satisfactory. We then looked hopefully forward to a revival in spring. Our spring trade is now a thing of the past, and if I may judge from the reports made in answer to the request of our secretary it has been fully as much of a disappointment as was the business of last fall. Our business experience is not very different from the experience of those in other lines of trade, and like effects are the product of like causes. In my opinion the present depression, which is almost world wide, is the result of overspeculation, overtrading, overproduction. The terms are synonymous, and only vary as applied to different branches of business. We are now at a point where there is no fictitious demand; the supply is still greater than the demand, and trade will continue dull until our normal consumption is reached and dealers will once more be willing to carry on their floors more of the products that now fill our warehouses. I think it will be admitted by all that less than the usual number of stoves were in the hands of manufacturers at the close of last year's business; that less than the usual number have been made this spring, and yet the present supply is ample for all requirements. The example of those who have been forced to economize has been contagious, and those who did have means, doubtful of what the future might have in store for them, bought only what they needed. The dealer who was in the habit of carrying a dozen or more of samples on his floor and in stock cut them down one-half, and do you know that the reduction of only two stoves each in the stock usually carried by dealers means over 60,000 stoves, which is equal to the product of a very large foundry, and when this is multiplied by three, which I think can safely be done, it means that stove manufacturers have lost in the mere reductions of stocks usually carried by the dealers a business of nearly $2,000,000. This is a healthy condition for the dealer, but hard on manufacturers.

Encouraging Features.

We can get some encouragement for the future from the fact that so few stove manufacturers and so few sellers of stoves were forced to the wall during the past year. It is gratifying because it shows that the trade generally has been done on a safe and conservative basis. Another matter for congratulation is the steady maintenance of prices and terms in spite of temptation to cut; that there has been no general cutting of prices cannot be gainsaid, and it is due in great measure to this association, whose traditions have always been that it was folly to attempt to permanently gain trade by reducing prices below a paying basis, or offering terms that were unbusiness like and dangerous alike to seller and buyer. While this association has never taken any positive action on the question of terms or prices, its recommendations have always been on the right side, and the discussions have shown a strong undercurrent toward the restriction of terms and the maintenance of reasonably profitable prices, and that this has had good effect is now shown. What the condition of trade would now be had this association never existed can better be imagined than described. It is left for us to continue in the same conservative management of our business that has prevailed in the last year, and be thus able to take advantage of the better times that are sooner or later sure to come, and which we, by our action, can help to hasten.

THE D. S. PHELPS COMPANY, Detroit, Mich., have an exhibit at the Detroit Pure Food Exhibition, consisting of Jewel steel ranges and Merit cast iron ranges. In connection with this display the D. S. Phelps Company make an elaborate showing of house furnishing goods, which includes two sizes of the Van Wie gas range and a specimen of the Pasteur germ proof water filter.

The Education and Production of Efficient Workmen.*

BY HENRY CRIBBEN.

The limited time I have had to devote to this subject prevents my going thoroughly into its salient points, but I will try to outline, as best I can, how in my judgment we can secure good and efficient workmen.

Let us first define what in our judgment constitutes a good and efficient molder. He should be temperate, industrious and work six days in each week, sickness or other unavoidable accidents excepted. He should be competent to perform the work assigned to him in a neat and workmanlike manner, and fully qualified at all times to make the necessary changes required of him that the business may demand. His work at all times should be made to strain weight, unless furnished dull iron by his employer, and oftentimes at less than strain weight, so that when the work is mounted into the stove, range or furnace the joints will be as perfect as the joints of the well fitted iron patterns from which he made his castings. He should see that his patterns are kept clean and free from rust, to enable him at all times to make work of quality that when finished shall nearly equal the pattern itself.

He should every day acquire some additional knowledge of his business, which is not only a trade, but an art that is at times mysterious and difficult to comprehend. He should apply himself whenever the opportunity offers to learning some part or portion of foundry practice, such as the best methods of lining the cupola, melting iron and properly mixing same after being melted in the cupola before it is allowed to run into the hand ladles. He should make a study of foundry machinery, including the blower and proper pressure required; should ascertain the best qualities of molding sand for making the different kinds of castings; should be kind in disposition, always treating his associates and employer with respect; should be honest, truthful and reliable, thus securing the respect and esteem of all with whom he comes in contact, and should constantly try to qualify himself to fill the position of foreman or superintendent, as employers will generally make their selection from among their employees if they find among them those that are qualified to fill positions of trust. Such men, in my opinion, constitute the good and efficient workmen; but this class is not numerous, and it has been the common remark of stove manufacturers when annually assembled at their meetings, "How small the number of efficient molders who have a thorough knowledge of foundry practice with the other necessary qualifications to make foremen or superintendents." There is at this time a far less proportion of good and efficient workmen than there was 30 years ago. The only reason that can be assigned for this is that the average molder has concluded in his own mind that when he learns the trade of iron molding he is destined to be a hewer of wood and a drawer of water for the balance of his natural life, and he has no ambition to perfect himself in his business nor to improve his condition when the opportunity offers.

Classes of Workmen.

There are at the present time three classes of workmen:

1. The traveling journeyman or Ho Bo, who goes through the country from foundry to foundry, remaining a sufficient length of time to earn enough to purchase some needed supplies and pay his board, and money sufficient to keep him until he reaches his next stopping place. He is, as a rule, never satisfied with the prices paid for his work, although efficient workmen make good wages on the same work at the same price; dissatisfied with himself and his associates, he creates as far as he can among his fellows a spirit of dissatisfaction and unrest. The work he makes, as a rule, is of an unknown quantity and of a very inferior quality, and on the whole he is a very undesirable class of man to have in your employ. The presence of this class has a very demoralizing effect upon the better grade of men.

2. The class constituted of those who have never received proper instructions when learning the trade, or that made a very poor use of the education received. They know very little about the art or mysteries of iron molding and do not seem to want to learn, for in their own estimation they are properly qualified workmen and put up as many flasks as the good mechanic. But when their production is inspected and counted, there are nearly as many of their castings go back to the cupola to be remelted as go to the cleaning room, and what are accepted are of inferior quality. If you speak to them of their inefficiency and tell them how to improve their work or save more of it, they put on a look of injured innocence and tell you that they are qualified workmen who have worked at the business eight or nine years, and are too experienced at it to need instruction from any one. They are so thoroughly imbued with egotism and conceit as to make them useless to any manufacturer.

3. There is still another class composed of workmen who are always learning, always on the alert to improve, who listen attentively and respectfully to any advice or instruction imparted by the foreman or superintendent, or even to any suggestions of their associate workmen, who take pride in producing good light castings and who can be relied upon to produce at least 95 to 98 per cent. good castings of all the work they put up on their floors. You will find these men at work every day of the week and every month of the year that the foundry runs, unless prevented by sickness or accident. If they are sick and not in condition to come to the works, they always have the foreman informed of their condition, so that if necessary the work on their floors may be made by some of their associates. Their discounts in the cleaning room and mounting department are very small, and the mounter finds little or no trouble in putting their work together. Stoves, ranges and heaters made by them give satisfaction in every respect. Castings made from a proper mixture of iron and to proper strain weight seldom, if ever, break from fire when made by practical and competent workmen.

Qualifications of Competent Workmen.

One of the secrets of producing competent workmen is in the selection of intelligent young men with the necessary qualifications, who with proper instruction and opportunities will aid in educating themselves in the mechanical knowledge of the trade. The applicant to learn a trade should be required to answer satisfactorily certain questions touching his future intentions as a workmen, such as:

Are you desirous of becoming a good workman?

Are you willing to honestly devote four years of your time to learn and to master as far as possible the art of molding?

Will you implicitly obey the instructions of your foreman and instructor in all matters connected with your employment?

Will you at all times while in the foundry refrain from vulgar or profane language, and from the use of intoxicating liquors, and discourage their use among your associates, not only inside the works, but at all times?

An apprentice should be taken on trial for a month to ascertain if he has the qualifications necessary for a capable workman, and the foreman or instructor should periodically report to the employer his fitness and conduct. If he be careless and shows a disposition not to apply himself, and the foreman is of the opinion that he has taken a dislike to his occupation, and the interest he seemed to have at the beginning is on the wane, he should be discharged at once, as he has not the qualifications necessary for an efficient workman. If, on the contrary, he evinces an interest in his occupation and a desire to learn, the foreman should give him every opportunity possible, and by counsel, advice and instruction assist him to secure the knowledge and skill he is in search of as rapidly as he is capable of receiving and applying it. He should receive encouragement from the superintendent and employer, who should take interest in the young man's efforts to become a good workman, should, when they meet, recognize him and inquire as to his progress, should stimulate him by words of praise for good conduct and application to business, and should spur his ambition to still greater efforts to become a good and skillful mechanic.

Some apprentices in the workshop, like boys in a school room, learn much faster than others, and should be encouraged, for the faster they learn the more profitable they become to their employers and the more money they earn, and if their efforts are properly recognized they will at a very early period approach to an equality with journeymen while still in their apprenticeship. If we desire to secure good and efficient workmen, we must furnish those who learn the trade with competent and qualified instructors to teach them its mysteries that lie hidden, so to speak, from the uninstructed in the brain of the qualified mechanic.

Employment of an Instructor.

All foundries employing 12 or more apprentices should employ at least one thoroughly competent instructor, as it is impossible for a foreman with his manifold other duties to find sufficient time to give that number of young men the instruction and advice necessary to enable them to become good workmen. If from neglect on the part of employers the apprentices are allowed to do and go largely as they please, of necessity when their time has expired many of them will be found among the worthless class of journeymen mentioned above.

The utmost care should be taken in the selection of foreman and instructors who have apprentices to educate; they should be thorough mechanics, competent and willing to instruct the apprentice by imparting to him the knowledge they themselves are possessed of in a manner that will not be offensive. They must be men of good moral habits and reputation, and their every day life, both in the works and outside, should be such as to challenge criticism for moral rectitude and sobriety.

The instructor should also possess a knowledge of how to instruct so as to secure the best results. He should be a judge of human nature, and when any pupil is worthy, he should be advanced by placing him on a floor located between two good workmen who will take interest in him and give him instruction and advice. All such cases of promotion and merit should be used as an incentive to spur others on to greater efforts by calling their attention to the rapid advancement of their associate.

Training the Apprentice.

The appentice should be strictly trained in the proper care of his patterns and tools, seeing that they are kept neat, clean and free from rust; to have a place on the floor for everything used; to observe a proper discipline, and to treat each other with respect. When he shows too great anxiety to make money on work he is accustomed to, by neglecting to do it well, he should be corrected, and if he still persists call a halt on him, by discounting all inferior work.

The apprentice should be indentured for the term of four years. The employer should feel in honor bound to give him a thorough and practical knowledge of the business, if the young man applies himself and carries out the instructions given him. It is also the duty of the employer to see and know that the instructor is doing his full duty in teaching the apprentices.

The method of indenturing will vary, as some of the States have no laws governing apprentices, and some that have laws on the subject are very unsatisfactory. As far as my knowledge extends, I would recommend the adoption of a contract with the young man, agreeing to pay him so much per week in wages, payable weekly or upon the ordinary pay day of the establishment, and a promise of a certain sum of money per week as a bonus to be paid at the expiration of his term of apprenticeship, provided he continues in the service and performs his duties faithfully during the four years. In case he is discharged for cause, such as neglect in performing his work, drunkenness, quarreling or fighting, he forfeits all claims to such bonus. Or it may be arranged that the apprentice work by the piece after the first trial month, for during that time he has been taught the rudiments of his trade, such as shoveling and riddling sand, keeping tools and patterns in good order, tucking bars thoroughly, and ramming up flasks containing simple work in a proper manner. He can be given simple plain molding to begin upon, and advanced when he has shown that he is making progress. So that from the time he begins work he will earn equal, if not greater, wages by the piece than he would have received by the week, and he has it in his power to increase his pay from time to time by the acquirement of increased skill and dexterity.

In working by the piece he should be paid a certain percentage of the price paid the journeyman molder, and in addition thereto a bonus of a given percentage on the amount of money earned by him during the term of his apprenticeship, payable, as in the case of weekly wages, at the ex-

* Read at the convention of the National Association of Stove Manufacturers held in Chicago, May 2 and 3.

piration of his time of service, provided he has performed his duty and has fulfilled the terms of his contract.

Let the wage system be what it will, it is very essential that the employer should take an interest in the young man, and see to it that he is properly treated and given every opportunity to become a skillful workman. He should see to it personally that the instructor is doing his duty. The apprentice should have easy access to his employer, who should hear him patiently and insure him at all times just treatment. He should be encouraged to save his earnings, so that when he becomes a mechanic he will feel thankful for the interest taken in his welfare.

The Apprentice System.

The apprentice system as it has existed for the past 30 years has been a source of annoyance and trouble to a great many manufacturers and of discouragement to the apprentices, for which to a very great degree the manufacturer on the one hand and the Molders' Union on the other are responsible. Apprentices have not been properly instructed Employed for the term of four years, during the time of their apprenticeship, they often do not learn to make more than six or eight different pieces of castings, and when as journeymen they are called upon to make a class of work different from what they have formerly made they are lost, so to speak, and are unable to produce good work, so that they are compelled to search for jobs such as they have made and they become known as specialty workmen. Since the close of the war and up to 1888, some two years after the organization of the Stove Founders' National Defense Association, there had been continual strife or warfare between the Molders' Union and the majority of manufacturers, the union making unreasonable and unjust demands as to prices that should be paid for labor and the enforcement of rules that were destructive of discipline and good order in any establishment, and the manufacturers resisting such glaring injustice, so that there were continual strikes and all means, fair and unfair, were used by both parties to accomplish the defeat of the other side. The union thinking and scheming how to make a success of their strike, would persuade the indentured apprentice to quit the service of his employer by agreeing to take him into the union and making him a full fledged union man and putting into his hand a union card, although he had not been employed at the business more than ten months or a year, and certainly was not a qualified journeyman molder. Some members of the union may deny this statement, but they are either ignorant of the facts or tell a falsehood to try to cover up the dishonorable and unmanly action of their unions. As the writer personally knows, 11 of his apprentices were taken into the union during the strike in his shop in 1884, some of whom had worked at the business less than nine months. The production of what is known as the hobo, and the inefficient, know nothing workman, is therefore directly traceable in a measure to the selfishness and neglect of the employer in not giving the apprentice proper instructions, but more generally to the dishonorable practices of the Molders' Union in inducing apprentices to leave their employers and by forcing on the trade with a union card in their pocket men utterly worthless as molders. But we are now looking forward to a brighter future and the production of a superior class of workmen, for since the organization of the Defense Association of Stove Manufacturers the Iron Molders' Union has in the case of its members abandoned strikes as a remedy for the differences that arise, and lets reason, justice and common sense prevail in the settlement by arbitration of all disputes.

Earnings of Workmen.

Having given the subject of good and poor workmen some considerable thought, during the 43 years I have been engaged in the foundry business, 18 of which were spent as an iron molder, working by the day or by the piece as the occasion demanded, my opportunities for securing authentic information have been greater than those of many of my associate manufacturers or of the ordinary workman, and my experience proves that the apprentice who serves his time, and by carelessness on his own part or neglect on the part of his employer to properly instruct him fails to become a qualified workman, loses at least 40 per cent. of his earning capacity, as compared with that of the good workman. I have watched with interest the respective earnings of the two classes, and find the average wages earned by the poor hobo and his companion, Mr. Know-it-all, to be from $2 to $2.50 per day by the piece, and that of the good workman from $3.50 to $4 per day; therefore, both being physically able to perform the labor required, the good workman being employed 11 months in the year of 26 days each, would earn, at an average of $3.75 per day, $1072 50, whereas the poor workman, working the same number of days at an average of $2.25, earns only $643.50, or a difference of $429 per annum against the poor workman. This loss is not confined to one year alone, but continues with him as long as he remains in the business, and if the average number of years he works is 15, he is a total loser to the amount of $6435. This is food for thought to both the apprentice and manufacturer. If the incompetent workman for the reasons given is in 15 years a loser of $6435, how much does the manufacturer lose by his employment when he occupies the same floor space as the good workman, but produces a little more than half the amount of castings and those of an inferior quality, but using about the same number of pounds of melted iron daily to pour his molds? The capacity of the manufacturer is reduced to that extent, besides the loss of remelting the large percentage of bad castings made.

If we can teach the apprentices that they can earn $429 more a year by becoming good and efficient workmen, it will not only stimulate them to acquire a more thorough and systematic knowledge of their business, but at the same time will prove to the employer that there is a large profit to him in turning out good workmen, and it will be a long stride in the right direction. Neither is engaged in the business for the sake of the trade or occupation, but solely for the money it gives. I am convinced that when this subject is taken hold of by employers and properly presented to the young men who are learning trades, an influence will be brought to bear on them that will bring forth good results in the near future, but it must be borne in mind that to secure such results the apprentice should thoroughly learn to make all the work, and especially the most difficult in the foundry in which he is learning his trade.

Improvement of the Mechanics.

It is a fact known to all that professional men are making rapid advances, perfecting themselves by study and experience in their various professions, but the condition of the mechanic has been quite the reverse, except in isolated cases. This is not a healthy condition of affairs. There is no good reason why the mechanic should not improve and become as skillful in the different trades and as thorough master of his calling as it is possible for the professional to attain in his vocation. And we as manufacturers should all agree from this time forth, as far as possible, to try and improve the standard of our workmen, by giving encouragement to our apprentices, by furnishing them better facilities, and by assisting them to improve the opportunities as they arise.

If the work of the apprentice is changed as fast as he becomes proficient and continues to turn out perfect castings for weeks successively, it will enable him to improve and will encourage him to become more skillful, and if properly followed up until he can satisfactorily make the most difficult work in the foundry, he will help to reduce this great army of incompetents hereinbefore mentioned, and at the same time will greatly assist in securing a large increase of good and efficient workmen in the line of our manufactures.

The Fuller-Warren Company of Milwaukee, Wis., are furnishing dealers handling their goods with water proof signs intended for display purposes. These signs are oblong in shape and are accompanied by a number of tacks specially adapted for the purpose, having sharp points and large heads. They are easily pressed into the sign for driving and do not pull or drive through as would be the case with a smaller head. These signs are embellished with the inscription, "Go to —— ——— for Stewart Stoves," the blank space being left for the name of the dealer handling the goods. The inscription is in white letters upon a deep blue ground.

Profit Sharing.*

BY C. S. PRIZER.

Would not every progressive stove manufacturer welcome the inauguration of a policy in the management of his business that, without diminishing his profits, would assure to him the best and most faithful service from his employees of which they are capable? If at the same time this policy would promote friendly and sympathetic relations between his employees and himself, and would cause his employees to feel the same interest in the quality of the product and the prosperity of the business which he himself feels, would not every stove manufacturer adopt it? The advocates of that modification of the wages system known as "profit sharing" make the following claims for their scheme when applied to manufacturing interests:

That it will increase the quantity of the product.

That it will improve the quality of the product.

That it will promote economy and care in the use of materials and tools.

That it will prevent strikes and labor difficulties.

That it will effect an improvement in the character and conduct of the workmen.

That it will reduce the expenses and largely obviate the difficulties of superintendence and inspection.

That by reason of the increased product and of the economies resulting from the operation of the scheme, there will be created an extra profit beyond the profit that could otherwise be earned by the business.

Definition of Profit Sharing.

Profit sharing may be briefly defined as any system under which the employees of a business house receive, as a bonus, at stated intervals, a part of the profits of the business in addition to their stipulated wages.

The basis and methods of this distribution will be determined by the varying conditions of different industries. In fact, an investigation of the leading examples of profit sharing in this country and in Europe shows no two cases in which the plans of distribution are identical. The advocates of profit sharing assert that no employer should consider that his own profits will be diminished by the distribution of a bonus to his workmen. They insist that the system must stand or fall on the proposition that under profit sharing the workmen create an extra profit over and above the profit that could otherwise be realized. It is a part or the whole of these extra theoretical earnings created by the system that is to furnish the fund for maintaining it. Participation in profits by workmen was first advocated by Turgot, one of the ablest of the early French economists, in 1775. He claimed, as do modern advocates of the scheme, that it would furnish a powerful incentive to workmen for the rendering to their employers of faithful, thorough and conscientious service. The plan seems never to have been put into practice, however, until M. Leclaire, a Parisian house painter, applied it to his business with marked success in 1842. Since that time, up to the year 1892, according to Nicholas P. Gilman, profit sharing has been adopted by about 300 establishments in Europe and America. About 100 of these cases are credited to the United States, but the records show that a number of houses in this country have abandoned the scheme after trials varying from one to eight years. Among the establishments noted by Mr. Gilman as having the plan in successful operation in this country are:

The Century Company, publishers, New York.
Pillsbury Flour Mills, Minneapolis.
Rogers, Peet & Co., clothiers, New York.
Globe Tobacco Company, Detroit.
Haines, Jones & Cadbury, brass goods, Philadelphia.
Procter & Gamble, soap, Ivorydale, Ohio.
Yale & Towne Mfg. Company, locks, Stamford, Conn.
Rand, McNally & Co., publishers, Chicago, Ill.
J. W. Tufts, soda water apparatus, Boston, Mass
Rumford Chemical Works, Providence, R. I.
N. O. Nelson Mfg. Company, brass goods, St. Louis, Mo.

The only instance of profit sharing in the stove business, so far as I can learn, is that

* Read at the convention of the National Association of Stove Manufacturers, held in Chicago May 2 and 3.

introduced by the late M. Jean Baptiste Andre Godin in the management of his foundry at Guise, France, in 1877. M. Godin is said to have been the first manufacturer in France to substitute cast iron for sheet iron in the construction of stoves. His experience in profit sharing seems to have been eminently successful, though his plan for distributing the bonus is quite elaborate and complicated, as the following account of it will show :

Distributing the Bonus.

" The profits of the year's business, after allowance is made for operating expenses, are subject to these deductions : 1. A charge of 10 per cent. on the value of movable property, and another of 5 per cent. on the immovable property, for depreciation. 2. Five per cent. interest on capital. 3. A certain amount for the educational privileges provided by M. Godin for his employees in his famous Social Palace. 4. A sum equal to 2 per cent. of the wages and salaries of the year for the benefit of the pension fund. The net profits remaining are then divided as follows :

" The reserve fund receives 25 per cent., a second 25 per cent. goes to the management, and the remainder is allotted to capital as a super dividend, and to labor as a bonus on wages. The usual interest on the capital of the establishment, and the whole amount paid out during the year in wages and salaries are added together. The proportion each sum bears to the total amount determines the respective shares of labor and capital. Thus in 1880, interest amounted to 230,000 francs, and wages to 1,888,000 francs. The bonus to labor was, accordingly, a little over eight times the amount of the super dividend to capital. The workman does not receive any part of his bonus in cash. It is all capitalized and applied to the purchase of shares in the business. No workman is admitted to participation who is not already the owner of one share of stock. All workmen, however, are encouraged to purchase stock. The interest on the stock held by the workmen adds considerably to their average earnings. In 1883 the house employed over 1400 workmen, of whom 793 were owners of stock, and hence participants in the bonus dividend. It will thus be seen that there is at work in this business an evolution which will finally result in a co-operative establishment."

Payment of Bonus.

In nearly all of the recorded examples of profit sharing, the workmen are paid but a small portion, if any, of the bonus in cash. The bonus is usually invested in a pension fund, applied to the purchase of an interest in the business, used to effect an insurance policy or to purchase an annuity, which shall be available when the workman shall become superannuated by old age or illness. In nearly all cases the benefits have been made to accrue only to the more important and efficient workmen, and to these only after they have been in the employ of the house for some stipulated period.

For those employers who believe that profit sharing constitutes a solution of the ever present labor problem there is the encouraging consideration that, unlike many other proposals for the settlement of this question, the plan can be carried into effect without legislative action and without securing the assent of a majority of the voters of the country. Each employer can test profit sharing for himself, beginning, if he so desires, in a tentative and experimental way, and extending the scheme as its success may warrant.

Suggestions for Stove Makers.

Should any member of the National Association of Stove Manufacturers desire to inaugurate a system of profit sharing, I venture to offer a few suggestions as the result of my investigation of the subject.

Let the management at the close of any business year announce to as many of its employees as it deems advisable to admit to the scheme, that in order to secure their full and sincere co-operation for the success of the business, it is proposed to divide among them, in proportion to their respective earnings at the close of the ensuing year, all of the surplus profit which it shall appear is due to their increased faithfulness, vigilance and efficiency. While this announcement to the employees should intimate that a fair and equitable method would be adopted for determining this surplus profit, the details of the method actually adopted for determining it should not be divulged to them, as the entire matter should be completely at the discretion and under the control of the employer. A number of experiments in profit sharing have failed because of differences between employers and employees regarding the amount of the bonus and the method of distributing it. Apply the plan to those employees who have been with the house for two years or more, in the following departments : molding, mounting, pattern, electro-plating, polishing, machinery, engine, selling, office.

Allow each employee the option of receiving his bonus in cash or of applying it to the purchase of stock of the company. If necessary, arrange for the issuance of stock certificates of small denomination, in order to afford employees better opportunity for acquiring a capital interest in the business.

The difficult feature of any plan of profit sharing which contemplates the distribution of an indeterminate bonus, is to estimate the increase of profit which has resulted from the operation of the plan. Various methods of estimating this increased profit will suggest themselves to the convert to profit sharing. The average profits, in percentages, of a number of ordinary business years might be taken as a basis, and the profit of a year under the profit sharing system in excess of such a basis might, taking into consideration the conditions prevailing during that year, be assumed to be due to the operation of the new plan. A more definite plan of distribution of profits to employees might be adopted by any stove manufacturer who is not afraid to take the full plunge into the policy of profit sharing. Out of the profits of the business a definite percentage might be first paid to the stockholders of the company. As much of the net profits beyond that as it is deemed feasible to pay out in a cash dividend might be divided equally, or in any other proportion, between the stockholders and those employees who are admitted to participation. Of course, any plan of profit sharing contemplates, before it is inaugurated, the existence of a profit at the close of the year, and I have therefore to confess with regret, that there are a great many stove manufacturers in the United States who, for an obvious reason, are not now, and have not for many years been, in a position to begin a trial of this beneficent scheme.

Objections to Profit Sharing.

The current objections to profit sharing, so far as the literature of the subject reveals objections to it, may be summarized as follows :

If workmen are to participate in profits in good business years they should also hold themselves ready to make up losses in years of bad business, by paying back at the close of the bad year a proportion of the wages they have received.

Profit sharing on these terms would be manifestly impracticable. If workmen are once permitted to share in the profits of a concern, they will soon insist that they be permitted to audit its books and accounts.

Profit sharing would result in undesirable publicity regarding the profits of a company.

If profit sharing is so sure to result to the advantage of both employer and employee, why has it not been more generally adopted? After having been tried for many years, in isolated cases, the number of houses practicing it is so small as to constitute an almost infinitesimal point in the immense world of business.

Profit sharing is merely a dream of idealists and philanthropists, and therefore not adapted to this hard and practical world. Profit sharing would, if generally adopted, and if the result claimed for it were realized, put workmen at the mercy of the managers. A good business manager would so conduct affairs as to be able to pay a bonus to the employees; a poor business manager whose employees worked just as faithfully as those in the former case, would not be able to realize a bonus for them.

Objections Controverted.

It seems to me that these objections are trivial and superficial. If nothing stronger can be urged against profit sharing the advocates of that industrial policy have a stronger case than have its opponents. Workmen would receive the current wages, without deduction, even if they had not been promised participation in profits. If no profit is realized their extra exertions due to the hope of receiving a bonus, yield them no pecuniary reward.

Very few investing stockholders ask permission to audit the books of the house in which their capital is at stake, and it is therefore unlikely that workmen without any capital invested in the business would do so. That profit sharing has not been more widely adopted does not prove the policy to be without merit. A strong force is required to overcome the inertia of habit, tradition and custom. It is no argument against any proposed innovation to call it an impracticable dream. Every man who has ever proposed a " better way " in any department of human activity has at first been charged with impracticability. Neither is it any argument against profit sharing to say that an incompetent manager will not be able to distribute as large a bonus to his workmen as will a capable manager. Under the present system the prosperity of the workmen is also inseparably linked with that of the establishment for which he works.

There are, however, fundamental reasons why profit sharing cannot fulfill the sanguine predictions made for it by its partisans

Von Thunen believed profit sharing to be " the only refuge and salvation of the working classes." Sedley Taylor, the learned English economist, gives the policy his unqualified support and asserts that its general adoption would result in great and permanent benefit to the mass of laboring men. Francis A. Walker says : " That profit sharing, if generally introduced . . . would be a cure for most of the labor troubles from which we suffer, seems to me beyond dispute." N. P. Gilman says : " Profit sharing is the one most practicable and most generally applicable measure of improvement (in the settlement of labor difficulties)." F. H. Giddings, a rising American economist, asserts that " profit sharing effects a more equitable distribution than can be realized by the unmodified wage system."

The American Association for the Promotion of Profit Sharing includes in its roll of officers, the names of such well known and practical men as Carroll D. Wright, N. O. Nelson of St. Louis ; Alfred Dolge of New York ; Henry R. Towne of Stamford, and George A. Chace of Fall River. Yet, notwithstanding, the weight of authority given to this movement by the able and eminent men who are engaged in promoting it, I am convinced that we cannot hope to find in profit sharing even a partial cure for the economic maladjustment of which the labor question is a symptom. In the cases where profit sharing has been successfully applied, the scheme has usually been carried out and reported upon by men of exceptional executive and administrative talent, who had strong prepossessions in its favor before inaugurating it. Were profit sharing applied to every productive and distributive industry it could not raise actual wages or improve the condition of those who toil. For, assuming that it will do all that is claimed for it in increasing the product and promoting the industry of workingmen, it is merely equivalent to inventions and improvements which augment the efficiency of labor.

If improvements and inventions which add to the power of labor could cure the economic ills that afflict us, we should long ago have reached an industrial millennium. Inventions and improvements that facilitate production are so far from constituting a solution of the labor problem that so close an observer as John Stuart Mill could say, " Hitherto it is questionable if all the mechanical inventions yet made have lightened the day's toil of any human being."

An Example of Failure.

An example of the failure of profit sharing to permanently raise wages is furnished by the history of the co operative coopers' associations of Minneapolis. At first all of these associations made money by eliminating the middleman and by effecting various economies in the manufacture of flour barrels. In his account of this interesting group of co-operative establishments Dr. Albert Shaw naively intimates that the co-operation itself was a marked success, but owing to a constant and unfortunate downward tendency in the price of barrels the workmen in these shops, who were all profit sharers, had finally to be content with the most meager returns for their labor.

That profit sharing has been applied with some degree of success in a few isolated cases is no proof that it would raise actual wages or increase profits if it were generally adopted, even assuming it to be as great an improvement as its advocates would have us believe. An improvement in machinery or in business methods may be an advantage to a house so long as the improvement

is confined to that one house, but the advantage is lost when the use of the improvement becomes general. When reading and writing were rare accomplishments the ability to read and write conferred distinction and had a money value.

It is impossible to raise wages above the point to which they gravitate under given economic conditions by any system of bonuses or premiums. When the English Government, attempting to mitigate the distress of underpaid agricultural laborers, paid out of the public treasury grants in aid of wages it was found that the recipients of these grants merely offered to work for that much less.

The advocates of profit sharing exaggerate what they term the "defects of the unmodified wage system." The assumption that a mere employee has little or no incentive to faithfully serve his employer is, I am confident, contradicted by the experience of every manufacturer in this meeting. An employee can usually promote his own welfare by conscientiously performing his duty toward his employer. The majority of workmen, in the stove business at least, instinctively put forth their best efforts to advance the success of the business.

Traveling salesmen could hardly be imbued with additional ambition or energy by the most liberal application of the profit sharing plan, as almost every traveling salesman knows that his remuneration depends directly upon the amount and quality of his work. The salesbook is a strict and vigilant superintendent. Yet traveling salesmen do not, on the average, render any better service than the other employees of a manufacturing establishment.

Profit Sharing in the Stove Industry.

It is doubtful whether the application of profit sharing in the industry of stove manufacturing would appreciably increase the product or improve its quality. The molders and the mounters, who comprise a majority of the force actually engaged in the work of making the goods in this industry, are turning out as large a quantity of product as can be expected of them. It is certain that the molders, at least, could not on the average turn out more work than at present without to some extent sacrificing health and longevity. That the piece workers in this industry do not, and need not, sacrifice quality by turning out a large quantity of product is proved by the fact that the goods of a well-known house, which probably turns out more stove plate per molder than any other in the country, are surpassed in excellence of workmanship and finish.

That a pecuniary interest in the success of a business does not have the magic and marvelous effect upon employees with which it is credited by the advocates of profit sharing is shown by an example that has come under my own observation. In this case a number of employees hold small amounts of stock in the company. Neither in the quantity of the work produced nor in its quality do these stockholding employees show any noticeable evidence of superiority to the average workman who has no capital invested in the company. I do not wish to be understood, however, as opposing the policy of encouraging employees to invest their savings in the stock of the company for which they are working. On the contrary, I believe that policy to be a good one, so long as the house is able to declare dividends, as it has a tendency to promote reliability and reasonableness among the men.

While it seems certain to me that we cannot hope to find in profit sharing even a palliative for the evils that in these times so sorely perplex the sociologist and the economist, yet the spirit that prompts such men as Wright and Walker and Gilman to turn to this policy is noble and commendable.

The fact that demagogues and social quacks find their occupation and opportunity in the existence of the anomalous industrial conditions that prevail over the whole civilized world should not deter thoughtful and conservative men from frankly facing the problems involved in our system of producing and distributing commodities, nor from earnestly seeking a solution of these problems.

Why have the numberless inventions and improvements that so immensely facilitate the production of wealth failed to assure a good living to every man who is willing to work?

Why is it that with boundless natural resources, which as yet we have hardly begun to use, vast numbers of men should be denied the opportunity of exchanging their labor for the things that labor produces?

What is the cause of that strange industrial congestion that prevents us from half utilizing the productive facilities at our command?

Why do wages, considered as a proportion of total production, constantly tend downward as the productive power of labor increases?

Why do the majority of business men find it increasingly difficult to secure an adequate return for their capital and labor?

These are the questions we must solve, or all of the splendid achievements of our civilization will finally avail us nothing.

Advantages and Disadvantages of Interchange of Information and Experience Between Stove Manufacturers.*

BY FULLER & WARREN COMPANY.

That a free and full discussion of methods employed and a frank interchange of data concerning every branch of the stove business would be of advantage to all members of this association seems entirely reasonable. Indeed, it can hardly be questioned, except on the supposition that the exchange of ideas would not be frankly done by some, or else that the burden of imparting information would come heaviest on a few whose knowledge is greater than that of the many. As to the first objection, while it is probably true that some would be only too willing to profit by any valuable ideas received while either refusing to impart anything valuable themselves, or doing it in such a manner that it would be of little value, it may be assumed that most people are not of that disposition, and, therefore, any objection to interchanging data because of them would be many times offset by the advantages to accrue to the great majority, who, it is fair to presume, would be candid in giving, as well as receiving, information. The other supposition, that a few might give to the many without a fair return, is also not a good objection. For, while it is true that in all bodies of men there are some who, because of superior knowledge have more to give than they can receive from any other individual, it is more than probable that they could gather as much information from all the others as they themselves would be able to give.

Free and Full Discussion.

By a full and free discussion of methods and a frank interchange of data is not meant merely the discussions that occur at these annual meetings, but a willingness between individual members to exchange or give at any time, when requested to do so, any data asked for regarding methods used in manufacturing and selling goods and collecting accounts. A knowledge of what your contemporaries are doing in manufacturing cannot fail to be of advantage; and this is so not because you may wish to use it against them, but because it sharpens your desire to be up to the times, makes you strive for new and better ways of working, and, in fact, gives you an interest and pride in your business that never comes to the man that goes along doing things in his own way, without the incentive that comes from contact with other men and methods.

And it is not only as a means of education that an interchange of ideas would be valuable, but it would really be a protection against unjust demands that cannot be refused, unless you can learn positively what your fellow manufacturers are doing. In your manufacturing departments it would protect you against payment of excessive prices for labor, for men cannot reasonably continue to ask one manufacturer to pay more than another for the same kind of work. This may seem to those who are not at present paying as great prices for labor as some others an unnecessary reason in their case for reciprocity, but they may rest assured it applies as closely to them as to their less fortunate fellows; for the associations of their workingmen, you may be sure, do not withhold from each other any data that will enable them to secure advantages, and the time will surely come when it will be necessary for the low paying manufacturers to meet a demand for advances to equal the prices paid by others, and then, to save themselves from paying more than the others, it will be quite necessary for them to know what the others are doing.

Some of the Advantages Resulting.

In your selling operations it would protect against unwarranted attacks on prices and terms by the retailer. As it is now the retailer has the manufacturer entirely at his mercy. He can, if he is unscrupulous, tell the salesman anything he pleases about terms offered by other manufacturers, and the salesman, in many instances, is obliged to be guided by the retailer's statements. Would this be so if the members of this association were willing to exchange information with each other? Would the continual increase in length of terms go on?

It is not the intention to make this a long paper, and as you are all probably familiar with such subjects, no more space will be given to illustrating it. The fact seems so clear that an honest interchange of data among the individual members of this association would be of advantage to all that it is earnestly hoped the discussions that may follow will be potent to accomplish something in the direction of an "interchange of information and experience between stove manufacturers."

* Read at the convention of the National Association of Stove Manufacturers, held in Chicago May 2 and 3.

The J. L. Mott Iron Works

of New York and Chicago have issued an attractive catalogue of furnaces, ranges and fire place heaters. It is known as Catalogue No. 1, to distinguish it from other publications of the company, No. 2 dealing with cook stoves, portable ranges and heating stoves, No. 3 with laundry ranges and iron heaters and No. 4 with furnaces and caldrons, steam kettles, &c. The printing is on an excellent quality of paper and the engravings are of such a character as to show to advantage the goods illustrated. Attention is first invited to Mott's Lenox double oven portable French range, made in several sizes and adapted for family, hotel and restaurant use. It is fitted with the makers' double action anti-clinker grate, roller ash sifter, patent warming shelf and broilers. Next in order is Mott's Defiance, made in several sizes and fitted with double ovens. It is made both portable form and adapted for brick work. Mott's St. George elevated double oven range is made in three sizes, while the single oven range under the same name is offered in one size. Mott's Defiance single oven range occupies a number of pages, after which Mott's gas shelf, provided with two burners and adapted for application to the Lenox or Defiance portable ranges, is illustrated. The closing portion of the volume is taken up with illustrations and descriptive particulars of Mott's Social fire place heater, which has been on the market for some time; the Osborne mantel stove, made under the Morrison-Sandford patent, and in construction being a return flue base burning stove with a draw center anti-clinker grate, dust flue and large illuminating section; Mott's Star furnace, made in portable form and for brick work, and the Comet, shown with and without exterior casing. Prices of galvanized iron range boilers are given, together with those of water backs, boiler stands, repairs, brick, grate bars, doors, frames, sliding dampers, &c. An interesting feature of the pamphlet is found in the illustrations of a cast iron flue lining made under Freyer's patent, one page being devoted to an illustration showing how the lining should be built in the wall.

THE UNION STOVE LINING COMPANY of Weir Village, Mass., resumed operations last week.

A Theory of Ornamental Design Applied to the Decoration of Stoves.*

BY JOS. LEON GOBEILLE.

To most of you the title of this paper will express exactly what we will discuss in the few moments allotted to us. You will see that it is really two subjects—"A Theory of Ornamental Design" and "Practical Application of Same to Stove Decoration." Between the two a gap occurs, which for various reasons, some of them obvious enough, we will leave open for another occasion.

The theory is simply an enlargement of the Newtonian suggestion that color and sound are, if not synonymous terms, at least so closely related as to be subject to like laws and like limitations. What we wish to show at this time is that form is included with sound and color, especially as understood when we speak of ornamental details. And when we speak of form we will take Webster's first definition—"The shape or external appearance of a body or figure as defined by lines and angles."

No one here will question that the effect of forms upon the eye is discordant or harmonious, according as their outlines and embodiment are agreeable, or the contrary, to that sensibility which we call good taste. The truth of the proposition will be apparent without argument.

It may also be set down that the perfection of art in form is that rich simplicity which attracts or repels the rudest minds. Out of many examples of the effect of simple lines to influence the mind of man two have been selected, which will be instantaneous in their action upon each one of you. Remember, they are an arrangement of elements, so primitive as to come below any written or picture language.

Symbolism.

It would be remarkable if every one here should agree with me as to what arrangement of lines into form is to-day the most potent symbol in the United States, attractive or repellant, as the case may be, yet that is precisely what you will do. It is shown in diagram marked Exhibit A.

It does not seem an easy task to select another composition as the second most effective and well understood design known. It is not an Acorn, nor a Diamond, nor even a Garland, and yet, as in the design of the cross, each one of you will agree that we have selected the arrangement of straight and curved lines, which deserves to rank as a good second in this country. (See diagram marked Exhibit B.)

Let us consider it settled, then, that certain arrangements of simple lines may be attractive or repellant if there be a proper basis for the design. The cross could be of no other shape and be effective. The dollar mark might possibly be, but its composition from the letters U. S., standing for "United States," stamps it as almost an inspiration.

To go one step forward in our argument, it must be admitted that in the decoration of two similar objects, say stoves, the same elements may be used with equal skill, but unequal taste, the one being noble and attractive, the other ridiculous and repellant. We will take the liberty of using a well-known stove company's trade-mark as an example of singularly felicitous adaptation of simple elements in the diagram marked Exhibit C. Now, we will show how the same elements can be used to produce the opposite effect, that is, to repel, in diagram marked Exhibit D.

So much by way of introduction, and now we will go along together in a popular view of some of the analogies of color and sound.

Those among us who have made a serious study of design and ornamentation know something of the difficulties in the way of making an explanation of the principles involved which will be so interesting as not to trespass upon the indulgence of the average listener; but I shall avoid technicalities and purely speculative propositions, so that every one here may easily follow the procession of the argument.

We have little to do with color in the decoration of stoves, yet it will be profitable to take enough time to state some of the primary analogies between color and sound, expressed for convenience, by the musical terms Tonic, Medient and Dominant (or the Keynote, third and fifth of the scale), as shown in Exhibit F. These in color would be the three primaries, red, yellow and blue, and to make this very plain and easily followed we will use a diagram showing these in the same position on a staff as if really musical notes. (Exhibit G.)

Now in music there are seven notes, four besides those mentioned—viz: The Supertonic, the Sub-dominant, the Sub-medient and the Sub-tonic, the eighth being of course the Octave tonic and therefore the commencement of a new series. But this presents no difficulties in the adaptation of the principle in color, for we have the proper notes for the four vacant spaces, viz.: Orange, green, purple and neutral gray, or, according to Sir John D. Macdonald, orange, green, indigo and violet. (Exhibit H.)

The inclusive octave of both sound and color is very simply shown on paper, and we think a harmonic unison established, so that all will intuitively recognize it. (Exhibit I.)

In Exhibit J (not illustrated) we may see an octave on the pianoforte keyboard with the corresponding tones of color properly located, and also the principal harmonies arranged in their natural sequences. This is according to the late G. G. Finn and is not precisely the same arrangement as we have used, but it is practically identical, the difference being in the reading of the prismatic wave length.

It must not be thought that because authorities differ in minor matters regarding the scale of color there can be any question about the scientific arrangement.

In regard to the difference above noticed, it can be very simply explained in this way: Blue and red mixed together mechanically produce an intermediate pure purple, but there are other ways to get at the intermediate besides actually mixing colors; in the prism, for instance, the diffusion of the yellow ray causes two colors to be shown—indigo and violet. If we had the time other apparent discrepancies could be explained on similar lines.

Sound and Color.

From the foregoing you will see that there is an analogy between the effects produced upon the hearing and the seeing organs of sense, but the similarity is still more striking when you consider that both are produced by vibrations more or less rapid, the one striking the retina of the eye, the other the drum of the ear, tones of color or sound being pitched in exact accord with the number of vibrations per unit of time, as has been scientifically demonstrated—*e. g.*, red, our tonic, is produced upon the retina of the eye by an atmospheric movement of 477,000,000,000,000 of vibrations per second, while the corresponding sound shown here as the middle C of our musical scale at concert pitch would be about 256 vibrations on the drum of the ear for the same time, and the ratio remains almost constant from tonic to octave and from red to violet.

Gentlemen, this to me is a most fascinating subject. You will get tired of it before I do, but I will hasten all I can. It is quite possible that the future musical symphony or etude may be written out, not on a staff as now, but in colors representing homologous musical tones. These can be tinted and merged into each other until the effects not now possible of expression in musical notation may be faithfully and felicitously shown by a scheme of color. This has only been impracticable heretofore because we have had no artificial light which would enable an untrained eye to distinguish between certain colors and shades, such as blue and green and indigo and violet. Now, however, with the electric light perfected to show all the various gradations of color, we may safely predict considerable activity in this field among scientific men in the near future. In Exhibit L I have caused to be written a grand old hymn in tones of color side by side with the accepted musical score, and, lacking some better illustration, I will attempt to show on my violin how the melody may be read and interpreted by means of the gradations and modulations as shown in the colored sketch. Notice the harmony of the tints and shadings to each other. Almost any good bit of musical harmony will work up with the same beauty and consistency in tones of color.

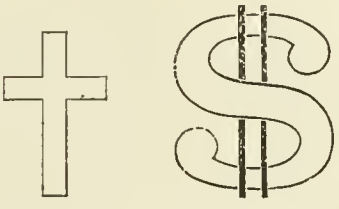


Exhibit A. *Exhibit B.*

Exhibit C. *Exhibit D.*

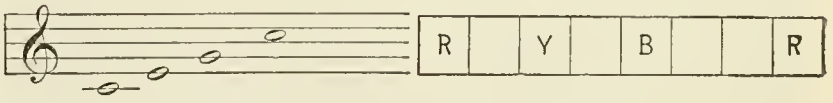


Exhibit F. *Exhibit G.*

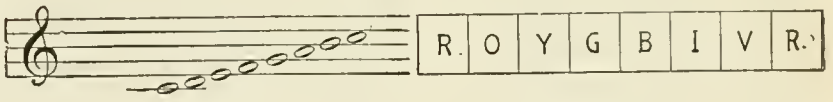


Exhibit H. *Exhibit I.*

A THEORY OF ORNAMENTAL DESIGN APPLIED TO THE DECORATION OF STOVES.

Color, Sound and Form.

Now, suppose we combine color and sound and apply our minds to the relation of form to this theory, and see what its analogies are. In the beginning it might be well to remember that a constantly widening circle of designers believe that form in effect upon the eye is distinctly analogous to that of sound upon the ear, and that color is simply the sensual side of form, differing therefrom only as the rainbow differs from the mountain crag, and concordantly joining with form and sound, all together marching in the same methodical procession of the gamut—tonic, mediant, dominant and tonic—and with the same constancy to the regular order of intervals in all the major and minor keys, while many go so far as to claim equal susceptibility to harmony, discord and effects of *chiaroscuro*, as for instance piano, forte, crescendo and diminuendo.

This being so, is it unreasonable in us to surmise that if one were sufficiently well versed in the basic principles of form we might construct a scale of forms on identical lines with color and sound? Think a moment; music was commonly known long before the notes were decided or dreamed

* Read at the convention of the National Association of Stove Manufacturers May 2 and 3.

of. Colors were grouped harmoniously long before they were classified in their positions, though after the summer shower the orderly sequence of color was proclaimed in the beautiful segment across the heavens; may it not be true that all the primary elements of form have been used over and over again in harmonious combinations by persons of artistic temperament, judging correctly by intuition, when a demonstration quite as decisive as that of the Euclidian problems, was potentially present?

Let us see what some of the probabilities are: Certainly the harmonic triad is not lacking for expression in form or outline; the straight, crooked and curved line, as exhibited in the square, the elastic curve and the circle, are in evidence. Again, if we look at form and sound in what might be termed their polite aspect, we find for the first white, gray and black composing together the monochrome, and in the second we have oratory, singing, and singing with instrumental or vocal accompaniment, or orchestration, while the structure of all musical sound bears out the theory of form in the tonic, the mediant and the dominant, all being used in quantity, arrangement and pitch to form a melody precisely as the gamut of the rainbow may be distributed and reunited in various combinations and sequences to form harmonies, contrasts or discords, form, color and sound being equally dependent for effectiveness upon an identical harmonic triad.

Now, if arrangements of sound in combination produce a distinct harmony or discord, and if combinations of color follow precisely similar lines, is it not reasonable that form may obey the same laws as color and sound? Again, if these harmonies and discords in sound and color are capable of being analyzed and classified so that from their positions in a diagram or staff a deaf man may construct a melodious and pleasing combination of tones, or one born blind can produce a harmonious color scheme, how much more reasonable that a knowledge of the Newtonian theory of color and sound will enable one skilled therein to design beautiful ornamental combinations, quite independent of any natural or acquired taste for decoration; and finally, if this person combines a scientific knowledge with a temperament susceptible to the effects of good or bad arrangements of elementary forms, such a one will of necessity compel recognition, as an expert designer, from all classes of people, especially from the educated and cultured, but with equal certainty from the rude and ignorant.

The Theory's Application.

We have not the time to go into an elementary explanation of how we place before our very eyes a chromatic scale of applied forms. It is enough that you have followed thus far and understand the possibilities of such an application. We have gone on together to an orderly and popular examination of the principles involved, and now we will discuss very briefly the application of all this to the decoration of your productions.

For, after all, and notwithstanding your patience and attention, what you most desire to hear is some suggestion which will show how to arrange the lines of proportion and ornamentation of your stoves as to produce, in a measure, the same effect upon the intuitive perceptions of the average prospective buyer that a scientific exposition would produce upon you or any other assembly of educated and cultured persons. Your goods ought to be so attractive that even the *persiflage* and hyperbole of a Fred. Gardner, or a Hope Boal, would be "love's labor lost."

In the development of a systematic scheme of ornamentation such as has been outlined, many disappointments and nonsequences occur and conclusions must be carefully made. The man who pays only superficial attention to matters of art is usually free with his opinions, often couched in the form of an *ipse dixit*, but when one devotes a lifetime to reading and study and practice, then caution and conservatism become factors in the equation. As hinted in the beginning, I am not so sure of my ground as to warrant a graphical demonstration of the gamut of form in its complete fulfillment, but of the results obtained there will be no hesitancy in placing examples before you and inviting intelligent criticism. In the first place, it is impossible to treat the formal decoration of stoves diatonically in the pattern as commonly constructed. The pattern must not be, in its original form, a wooden plate upon which is planted, almost at random, incongruous figures and shapes miscalled ornaments, but, on the contrary, the pattern proper and its decorative features should be an entity. It follows then that the completed model will be little more than a plastic sketch in clay or similar material. But there is another reason why this must be so—stoves are made of cast metal, which in process is a liquid. It is in waves and undulations while being poured, coming to rigidity very gradually, therefore, to be in unison, a similar substance must be used from which to fashion the model. Clay is not an ideal material by any means, but it is susceptible to manipulation and is the best thing known. It must first be treated for various weaknesses, particularly that of cracking when dry. In Exhibit M, five well-known methods are shown. 1, the clay model; 2, the wax model; 3, the carved wood; 4, the glue and white "compo"; and last, that friend-in-need of the man without an idea, a bit of Linerusta-Walton. The artistic superiority of the clay and wax models is in evidence.

Another mistake is to so design a piece of ornamental cast iron as to project details of any depth at right angles to the flow of the metal in casting; curves, gentle undulations and boldness, without distinct abruptness in the rise of the higher portions, is the desideratum.

As you would not overlay one opaque color upon another, nor in sound place in juxtaposition two or more discordant notes, so in ornamentation the different elements should be amalgamated, or at least joined permanently. For example, tiles should be cast into your plates if you desire to use them, not fastened in with a frame. I show my idea in Exhibit N.

Lettering ought to be sparingly used and never merged into the design proper. After many experiments it seems that a brass letter, cast into the plate, is the most practical; and it is really very handsome. (See Exhibit O.) Above all, avoid the so-called ornamental lettering put on in warts and patches. If you have anything to say in cast iron pipe, use an honest, straightforward alphabet.

Our principle applied to the use of mica is rather bewildering; for it must be cast in the door, not fastened with a mica frame as now. And yet why not? Mica doors are the lighest parts of a stove, the easiest dismounted and replaced, thanks to the tin hinge tube. If the mica wears out why not allow the user the privilege of buying a new door, mica and all, from the original maker? To see the beauty and practicability of this, notice Exhibit P.

There is literally no end of changes necessary in your practice if this diatonic scale of form is correct; but too much time has been taken already. In closing, permit me to thank you for your attention and to express my appreciation of your kindness in inviting me to discuss with you some of the many really important matters relating to the design of ornamental patterns.

Echoes of the Convention.

— The headquarters of *The Metal Worker* were in Room 646 in the Auditorium Hotel, immediately opposite the entrance to the convention hall. Attention was called to the headquarters by a number of copies of the paper festooned about the entrance. The members of the association quite generally dropped in to greet the representatives of the paper, and at times there was a large party assembled discussing various phases of the stove trade.

— Among those who thus graced the headquarters with their presence, one of the most brilliant conversationalists was B. W. Dodson of the Detroit Stove Works, whose sallies of wit were well received, even by those who formed the target for his good natured attacks.

— Another very welcome visitor was A. C. Mott of the Abram Cox Stove Company, whose discourse was of the substantial order, as befits one who represents the dignity and sterling worth of the Quaker City.

— N. B. Perry of the Perry Stove Company was a genial visitor, who generally permitted others to do the talking, but would occasionally interject a remark which squarely struck the heart of the subject.

— Francis Kernan of Utica told of some interesting experiences he had passed through in Chicago, which illustrated the humorous side of life, but as the subject is barred in these columns they cannot be repeated. Mr. Kernan bubbles over with humor, and evidently is more of an optimist than business men are generally, especially in these times.

— The delegation of manufacturers from the South shivered for part of the week while the breezes blew from Lake Michigan over the Garden City. It was quite an abrupt change from a temperature of 90° or thereabouts, which they had been enduring, to 50° or even lower. For a time overcoats were in pressing demand. In the convention hall, however, the warmth of some of the discussions partly atoned for the low temperature outside.

— It is said that the leading officers of the association will rejoice in the possession of new hats at the expense of one of their number. It is the result of a bet which was made on some subject connected with the Defense Association, but the details of which seem to be carefully guarded by those concerned. The bet was of a cumulative character. When it was first made, the bettor was so positive of his position that he immediately wagered another hat with the bettee that the latter would lose. This was accepted, and immediately an associate of the bettor wagered another hat with the bettee that he would lose both bets. Again the proposition was accepted, but as the bettee thought that three hats would be too many for him to occupy at one time, he announced that if the bet should be won by him the hats would be divided among the three principal officers aforesaid. And he won.

— The practical men among the stove manufacturers were very much interested in the operations of a machine shown by J. Winfield Pugh, representing the American Machinery Company of Detroit. It is a universal trimmer, and is particularly adapted to use in the pattern shop for squaring, mitering, making core wedges, cutting segments, cutting gear teeth, &c. The cutting is done with knives, truer than with a saw and smoother than if sandpapered afterward. The machine is operated by hand, the knives moving in guides and thrown forward and back by a lever. It is mounted on a column and can be swiveled in a complete circle to suit the operator's convenience or held at any point by means of a nut.

— The many friends of Frederic W. Gardner were pleased to see that he was again able to be out after having endured a long siege of illness. The primary cause of his trouble was a heavy cold which rapidly developed serious tendencies, requiring the most skillful treatment.

— Francis Kernan of Utica, N. Y., is now one of the veterans of the association, having taken part in the deliberations of the second convention and thenceforth attended every annual meeting. Mr. Kernan is one of the most genial of the many amiable members of the stove fraternity and has the happy faculty of ever looking on the bright side of things.

Taplin, Rice & Co.

We have received from Taplin, Rice & Co. of Akron, Ohio, a carefully arranged and neatly printed copy of the illustrated catalogue and price-list which they have just issued from the press. In the make up of the volume the body of each page is printed in bluish ink, while the ornamental border is in a light chocolate color. The design of the border embraces sprays of ferns, a *fac simile* of the company's trade-mark, and running down the edge, at the left hand, their name and address. The company have been engaged in the manufacture of stoves over 26 years, and during that period have used every effort to establish and maintain a high standard of excellence in the character of their goods. The future policy of the company, it is stated, "will be marked by an energy

that will command the confidence of the trade and merit the continuance of the liberal patronage" which they have thus far enjoyed, and for which they make grateful acknowledgments. The goods shown are offered under the generic name Climax, and consist of an interesting assortment covering ranges and cook stoves for burning coal and wood, and also those for burning wood exclusively. The heaters occupy the closing pages, the leading position being given to the Solar Climax, which is the company's latest addition to their line. In it is embodied many of the features which have rendered some of their other goods so popular with the trade, while portions, especially above the fire pot, are entirely new. The ornamentation is neat, nickel work being judiciously combined with the black surfaces. A line of hot air furnaces completes the catalogue, which is bound in stiff board covers, with attractive side title.

ODD PLATES.

Numerous changes have taken place in the domiciles of the Chicago stove houses. Lake street has lost some of the establishments which had been so long on that street that they were landmarks. Cribben, Sexton & Co. have removed their salesroom to the foundry, which is on Erie street, on the north side of the city, and S. S. Jewett & Co. have consolidated their sales department with the warehouse on the south side. The Brand Stove Company have closed up their Chicago sample room. The west side colony of stove houses has also suffered from further withdrawals. The Detroit Stove Works have removed to their new warehouse on Twenty-ninth street, and two or three houses are entertaining propositions to remove to other locations. The stove interests of Chicago are now widely scattered, being found all over the city. In few cases are there more than half a dozen concerns within easy walking distance of one another. Receiving and shipping facilities now seem to have paramount consideration among the stovemen, little thought being given to the convenience of buyers visiting the city, because such visits are steadily becoming further apart.

"The Home Comfort Cook Book" is the name of an interesting publication which reaches us from the Wrought Iron Range Company of St. Louis, Mo. It bears date of May, 1894, and consists of 164 pages of letterpress, illustrated with numerous engravings and bound in colored paper covers, the front of which represents the interior of a kitchen fitted with a Home Comfort wrought steel range. On the smoke pipe, just above the stove top, is a plate indicating the number of Home Comfort ranges sold up to January of the present year. This number is given as 277,188. The ranges are made of malleable iron and cold rolled wrought steel, and are provided with either four or six boiler holes. The oven door drops to a horizontal position, and is said to be so braced that a heavy jar or pressure cannot break or injure it. The front and rear of the oven are fastened to the body of the range by heavy malleable frames, while the top frame is fastened to the body by heavy lugs. These ranges are adapted for use in hotels, restaurants, public and private institutions, steamboats, dining cars, &c. Among the opening pages we find extracts from newspapers relating to the company and their goods, a general view of the company's office, salesroom and factory in Toronto, Ontario, a short history of the business of the concern, together with mention of the materials employed in the construction of the Home Comfort goods. As indicated by the title of the work the greater number of the pages are devoted to recipes which the housewife is likely to find useful. There are also given a large number of testimonials, as well as lists of names and addresses of some of those who are using the company's ranges. The latter portion of the catalogue is devoted to an illustrated description of the Home Comfort steel range, following which, attention is given to a miscellaneous assortment of kitchen utensils, hot air furnaces, hotel cooks' and butchers' cutlery and an alphabetical index. The fourth page of the work is embellished with a general view of the office, salesrooms and factory of the Wrought Iron Range Company, which cover an entire block.

The Culter & Proctor Stove Company of Peoria, Ill., started their foundry April 30 after a suspension of several weeks. They put on a full force of workmen and will now run steadily. They report excellent prospects, having a good demand for their line of stoves and ranges. In fact, the foundry has been started somewhat earlier than the company had anticipated when they shut down.

Smith & Bright, agents for the sale of Graff & Co.'s Faultless and Hero furnaces, have removed to 175 and 177 Lake street, Chicago, where they have secured enlarged facilities for accommodating their increasing trade. The new location is nearer Fifth avenue, an important north and south artery of commerce and street car transportation. In their new location they will carry a much larger stock of hot air furnaces and hot water heaters. They have just closed a contract for heating a school building at Sheboygan with a combination of hot air and hot water.

The Brilliant Steel Range & Gas Machine Works of 9–19 Church place, Cincinnati, Ohio, send us a folder of liberal proportions illustrating the Brilliant steel ranges which they manufacture. These stoves are made for burning hard or soft coal, gas or wood, and are offered in a variety of styles and sizes. They are fitted with reversible and dumping anti-clinker grates, with automatic balance lock, asbestos lined flues, oven doors fastened with automatic gravity latch with gravity catch, revertible drop chute feed door doubled, lined and ventilated, oven plates thoroughly braced and all joints closely hand riveted. All ranges are made with or without broiler, top closet or tank attachment. The hot water heater extends the full length of the fire chamber and the heating capacity is referred to as being exceptional. The company call attention to their Brilliant gas machine, Brilliant gas cook stoves and Brilliant gas heaters. The company include E. Schmidlin, J. N. Rabenstein and C. V. Fleetwood.

A press dispatch under recent date from Warren, Ohio, is to the effect that the Etna Foundry & Machine Company of that city have decided to discontinue the manufacture of machinery and to so alter the plant as to turn out steel ranges and hot air furnaces.

Sam S. Utter has the sympathy of a wide circle of friends, both in and out of the stove trade, in the death of his wife, which occurred on May 9, at the St. George Hotel, Brooklyn. The funeral services were held Thursday evening, at 8 o'clock, at the residence of John L. Utter, 365A Quincy street. The attendance was large and included many representatives of the stove trade.

The Fuller & Warren Company are distributing a couple of leaflets illustrating the Stewart range, made with large square oven and their No. 142 double oven range, made in portable form and also adapted for brick setting. These are both new constructions, the Stewart having a large draw out hearth, wrought iron ash pan, patent oval fire box and interchanging triangular Dock-ash or draw center grates, which may be removed without disturbing the water front or linings. The double oven range has sheet flues, direct draft damper and a water back which can be removed without displacing a bolt, new pattern handles on all doors, patent oval fire box and triangular revolving grate. The doors of the oven, broiler, firebox and damper are arranged to drop.

Charles Whiting, who represents the interests of Eugene Munsell & Co. of 218 Water street, New York, has just returned from a business trip, having secured a number of good orders for gasoline stoves.

The Bennett & Peck Heating and Ventilating Company of Cincinnati are represented in Chicago by W. H. Martin at 82 West Washington street. Mr. Martin has had a long experience in the heating and ventilating line, and takes special pleasure in handling difficult problems in satisfactorily heating large buildings for public gatherings.

The friends of the Chicago & Erie Stove Company of Erie, Pa., are offering their congratulations on the successful introduction of the company's goods in the United States Navy. The Government has recently purchased two steel ranges, hotel size, for use aboard the man of war "Michigan." This purchase is all the more gratifying when it is remembered that the Government officials inspected a number of steel ranges, and finally selected the company's Superb Helper for trial, after which it was subjected to the test of several months' service before the purchase was completed. The "Michigan" is intended for cruising on the Great Lakes.

The New Era steel range, made by the H. Franke Steel Range Company of Cleveland, Ohio, was used at the recent exhibition of bread baking at the store of A. S. Phinney. Six tests were made, and according to the Erie *Evening Herald*, "bread was baked in just 15 minutes by the watch, the fuel being natural gas."

The Meyer Furnace Company of Peoria, Ill., were recently incorporated, with a capital stock of $50,000. The list of incorporators includes the names of Frank Meyer, D. Meyer, George F. Meyer and George Harms.

The Security Gas & Vapor Stove Company, St. Louis, are directing the attention of the trade to their Security gas range, with barbecue steak broiler, copper water heater and lighting torch. The goods are substantially made, and are being placed on the market for both summer and winter use.

The Girard Stove & Foundry Company of Girard, Ohio, have decided to erect a new foundry building and give employment to an increased number of men. Various places for the erection of a plant are being considered, each of which, we understand, will offer some inducement. At the date of latest advices no decision had been reached as to location, but it is expected the matter will be settled before this issue reaches our readers.

TRADE REPORT.

The Iron Market.

The situation is very much mixed, the growing scarcity of Coal and Coke interfering very considerably with operations. Production of Pig Iron was 16,522 tons less weekly on May 1 than it was on April 1; and since then we have advices that 17 other furnaces, representing a tonnage weekly of 21,192 tons, have stopped. Further additions to the list are known to be sure during the next week. The resulting scarcity of Bessemer Pig has driven the market upward to $12, Pittsburgh, transactions having been closed for upward of 30,000 tons, including one block of 13,000 sold by a Cleveland interest to a Pittsburgh concern. Even then the demand has not been filled.

If the strike should continue and establish a permanently higher range of values, which many are confident of, then the pressure of Pittsburgh, Wheeling and the Valleys in Eastern and Western markets will be much relaxed. The advance in freight rates from the Pittsburgh district east and west will aid in the same direction.

So far as the rolling mills are concerned they are able to worry along much better than the furnaces. Natural gas in some sections and oil in others is enabling them to make pretty good time thus far. The result is that in spite of the rise in raw material Finished Iron and Steel has moved but little. The feeling is a little firmer, but no real advance except for immediate requirements has been established. It seems reasonable to expect some improvement to correspond with the higher coat.

It is an astonishing fact, but it remains a fact, that there are signs of weakness in some sections in the market for Foundry Irons.

Pig Iron.—There is only a moderate run of inquiries and current business is light in the New York market. Some of the furnace agents have had instructions to withdraw from the market, but in spite of that competition continues keen and prices have not been favorably affected as yet. We quote standard brands $12.50 @ $13.25 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9 75 @ $10.25.

The Philadelphia Pig Iron market is not in a satisfactory condition, although the volume of business is maintained, and the supply not excessive, although ample for all demands. Prices are very irregular and on the whole a shade lower than they were a week ago, but it is almost an impossibility to give exact quotations. The entire demand seems to be for No. 2 X, or No. 2 Plain, the former being quoted all the way from $11.25 to $12, with the bulk of the business at $11.35 @ $11.50, but all depends on what the Iron may be, how much is taken, and at what point it has to be delivered. Plain No. 2 and lower grades are nominally $10.50 @ $10.75, but the right kind of a buyer can come pretty close to $10.25, although the supply of that grade is not excessive. General quotations for Philadelphia and equivalent points are about as follows :

Standard No. 1 Foundry X	$12.50 @ $12.75
Standard No. 2 Foundry X	11.25 @ 11.75
No. 2 Plain	10.75 @ 11.00
No. 1 Soft	11.50 @ 11.75
No. 2 Soft	10.75 @ 11.00

A little improvement is noted in the sales of local Coke Iron in the Chicago market and the inquiry has notably increased. Consumers are not disposed to purchase larger lots than heretofore. But they are inclined to purchase oftener. Sales of Southern Iron are confined to small lots in the same way, but an occasional buyer is making inquiries on round lots. At least one conspicuous Southern brand is now out of the market on account of the scarcity of furnace fuel in the South, and others are expected to be withdrawn very shortly if the strike does not speedily come to an end. The foundrymen in the Chicago district are beginning to run short of Coke, and some of them have already reduced their output of castings. This will restrict the demand for Pig Iron if it assumes any large proportions. The Foundry Coke dealers hope to be able to secure enough Coke from districts unaffected by the strike to keep the foundry trade supplied. The demand for Lake Superior Charcoal is light. One of the leading producers of this class of Iron reports that April was the month of smallest trade he had for several years. The demand is very rarely for larger than carload lots and prices are well maintained on such quantities. Quotations are given as follows for cash :

Lake Superior Charcoal	$15.00 @ $15.50
Local Coke Foundry, No. 1	11.25 @ 11.50
Local Coke Foundry, No. 2	10.50 @ 11.00
Local Coke Foundry, No. 3	10.00 @ 10.50
Local Scotch	11.50 @ 11.75
Ohio Strong Softeners No. 1	12.60 @ 13.50
Southern Silvery, No. 1	@ 11.50
Southern Silvery, No. 2	@ 11.00
Southern Coke, No. 2	10.00 @ 10.35
Southern Coke, No. 3	9.75 @ 10.00
Southern, No. 1, Soft	10.25 @ 10.50
Southern, No. 2, Soft	9.75 @ 10.00
Tennessee Charcoal, No. 1	15.00 @ 15.50
Tennessee Charcoal, No. 2	14.50 @ 15.00
Alabama Car Wheel	17.85 @ 18.00
Jackson County Silvery	15.00 @ 16.00
Other Ohio Silvery	12.50 @ 13.00

In the Pittsburgh district the Coke strike is playing havoc with the furnaces, more than half the number being closed. The Cleveland district is also idle. It is the impression that even with a settlement of the Coke strike prices of Bessemer Pig will not materially decline, as many of the furnaces are sold ahead for two or three months, and the available supply is bound to be limited for some time. Owing to the light demand for Foundry Iron, prices have shown very little improvement. For spot deliveries of Pig Iron we quote as follows:

No. 1 Foundry	$11.00 @ $11.25, cash.
No. 2 Foundry	10.25 @ 10.50 "
No. 3 Foundry	9.75 @ 10.00 "
Bessemer	12.00 @ 12.50 "

According to our Cincinnati advices trade in Pig Iron at that center continues to be greatly restricted. Many of the furnaces are accepting no orders for forward delivery, but there is no great demand, so that prices are not much better than nominal. There has been a fair business in a small way for current consumption in this district and in the East, the orders being from one to three carloads, mainly for Coke Foundry, but with a fair sprinkle of Charcoal Iron ; and although the orders are individually small, they make a considerable aggregate. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke, No. 1	$10.25 @ $10.50
Southern Coke, No. 2	9.25 @ 9.50
Southern Coke, No. 3	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.00 @ 14.50
Lake Superior Coke, No. 1	12.50 @ 13.00
Lake Superior Coke, No. 2	11.50 @ 12.00
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.00 @ 13.50
Tennessee Charcoal, No. 2	12.00 @ 12.50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable	16.25 @ 16 75

The situation in the St. Louis market is not materially changed. The strike in the Southern district has had the effect of making prices a trifle firmer. The scarcity of Coal is also having a beneficial effect, and it is pretty generally agreed that should the Coal strike continue through the month of May at least 50¢ ℔ ton will be added to the selling price of Iron. Sales during the week have been fairly good. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.75 @ $11.00
Southern Coke, No. 2 Foundry	9.75 @ 10.00
Southern Coke, No. 3 Foundry	9.50 @ 9.75
Southern Car Wheel	16.75 @ 17.75
Lake Superior Car Wheel	16.25 @ 16.50
Ohio Softeners	14.25 @ 14.50

Metal Market.

Pig Tin.—Regular trade purchases have been routine in character and merely fair all told. Speculative movement has been moderate also Still prices have climbed quite as much as London fluctuations warranted, finally getting up to about 20.10¢ net cash for 5-ton or larger lots, prompt or near future delivery, with distant futures at some premium. The idea exists that pure manipulation has been largely instrumental in helping prices upward and that London operators are the chief manipulators. This idea is not without reason, since London fluctuations have apparently governed local prices in a great degree irrespective of the statistical position on this side of the Atlantic, while local representatives of leading London operators have been the stiffest bidders on both nearby and distant future deliveries. In actual sale prices have been carried to 20.10¢ @ 20.15¢ net cash for 5-ton or larger lots, while up to 20¼¢ regular terms were paid for ordinary jobbing parcels. Small lots from store are quoted at 21¢ @ 21¼¢ ℔ lb. The supply in first hands here, it is estimated, does not exceed 700 tons, or the equivalent of about three weeks' consumption.

Copper.—The situation is wholly unchanged. Home consumers are slow buyers and exporters more carefully in view of the weakish condition of the European market. The foreign markets, it is claimed, are not paying over the basis of 9¼¢ for Lake Superior Ingot, relatively more for other varieties and special rates to large home consumers are said to be the rule rather than the exception. This on speculative offers to sell at 9.40¢ gives the market a weak appearance, although 9.50¢ stands as the popular quotation Electrolytic is freely offered at 9.25¢, and it is understood that bids of 9.12½¢ have been solicited in numerous instances. Casting stock remains at about 9¢ @ 9.12½¢.

Sheet Copper.—The market for Manufactured Copper continues tame. Orders and inquiries come in very slowly, consumers displaying an unusual lack of interest. Prices are inclined to softness.

Pig Lead.—Merely routine business has been done here, and the demand has shown no spirit whatever. In fact, the only display of life was on the part of a few speculators who ventured to offer to sell at as low as 3⅝¢ for June and July delivery. They sold very little, if anything. although brokers obtained 3.40¢, 3.42½¢ and 3.45¢ for carload lots of desilverized from consumers. The indications are that a "bear" interest has been striving to force values lower by tricks with which they are familiar, and that speculative circles have been used to best advantage in that connection. The consumptive demand has been comparatively feeble both for Pig and manufactured Lead. Jobbers' price for small lots of the former remains at from 3½ to 4¢ per lb.

Spelter.—Very little business has been done here and the Eastern demand has continued extremely tame. All signs of speculative interest have vanished, and the best efforts with consumers have been slimly rewarded, purchasers being satisfied to provide only for their immediate wants. Hence a flat sort of market, with prices still rather soft at about 3 50¢ @ 3.55¢ for common Western, delivered here or at common point, with an advance of about ¼¢ on small quantities. Stocks are, however, lower than ever, and any large orders would suffice to send prices upward.

Antimony.—Sales have been made at 8¾¢ @ 8⅞¢ for Hallett's, 10⅛¢ @ 10¼¢ for Cookson's, and corresponding prices for other grades. The jobbing demand has been very fair, and prices for small quantities steady, at an advance of about ¼¢ on those above named.

Nickel. — Prices are considerably apart, varying according to size of order, &c. There is merely routine business. The range of 45¢ @ 50¢ is quoted.

Tin Plates.—It cannot be said that the market displays any change in the direction of improvement. Consumers have been taking spot goods in a very limited way only. Purchases from store fall considerably below the average for the season, and individual orders are generally of the small hand-to-mouth character with which dealers have become so familiar of late. Even those customers who in ordinary times are the most liberal buyers appear unwilling at the present time to take a box beyond what they actually need to fill their passing requirements, notwithstanding the low prices now ruling. Future deliveries also are in limited demand, and are confined to a very few weeks ahead, in view of possible tariff changes in the near future. Import shipments continue light and stocks in importers' hands are becoming attenuated. Scarcity is noted in some lines of imported Plates, yet prices remain rather weak, though showing no quotable change. In regard to the Tin Plate market in the West, our Chicago representative reports as follows: Roofing Plates are very scarce. Every American mill appears to be loaded up with business, and brands are being withdrawn from the market, as the manufacturers are not in shape to take additional orders for early delivery. Under the circumstances prices might be expected to advance, but for some reason the scarcity has so far failed to enhance values.

A special cable dispatch to *The Iron Age*, dated London, May 9, describes the British Tin Plate market as follows:

In Tin Plate business has been limited, but there is some sign that buyers are more inclined to make contracts. Canadian buying of Charcoals and Ternes is particularly favorable. Stocks at Swansea are now about 276,000 boxes. Output of works has greatly receded owing to dispute with operatives, but is still fair and exceeds shipments. Liverpool quotations are as follows:

IC Charcoal, Alloway grade	12/ @ 12/6
IC Bessemer Steel, Coke finish.	11/3 @ 11/6
IC Siemens " " "	11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20	Nominal.
Charcoal Terne, Dean grade	10/3 @ 10/6

Sheet Iron.—Galvanized Iron shows a firmer feeling, and some mills are said to have withdrawn their quotations. Yet jobbers maintain that the demand for this material is still on an exceedingly narrow scale and that at present prices it scarcely pays them to handle it at all. Black Sheets, except those of light gauge for tinning, are moving slowly, consumers having apparently placed their orders with the mills for all that they will require this side of July. Prices are unchanged at their former low level.

Chicago Report.

Scrap.—Business contiuues very light. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ?
Rubber	....	3½¢

Anthracite.—Dealers report very little trade moving. The famine in soft Coal has not yet been severe enough to cause consumers to turn to hard Coal. Carload lots of 12 net tons or over are quoted as follows:

	Egg, Sto. Grate.	and Ch.
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6 75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

THE JOHN SIMMONS COMPANY, 106–110 Centre street, New York, dealers in Pipe and Pipe Fittings and Supplies, are issuing a circular on Ash Cans, giving their experience with those of ordinary manufacture and by means of a half tone engraving show them after two months' use. They state that their experience has been unsatisfactory and that they have got up an Ash Can for their own use which they are now offering to the trade.

THE TRADE will be interested in the announcement on another page of Smith & Winchester, Boston, Mass., which calls attention to the Boiler they are just putting on the market, which is to be known as the Winchester. They invite the trade to arrange for agencies for this new apparatus.

E. W. BLISS COMPANY, Brooklyn, N. Y., issue notice to the trade that they have lately removed their Chicago office and works from their former location at 414 Canal street to more commodious quarters at 100, 102 and 104 West Washington street, where they will continue a representative line of their Presses, Drop Hammers, Shears and Sheet Metal Machinery. The Chicago office is still in charge of C. W. Ellsworth, late superintendent of the Chicago Stamping Company, whose large experience with tools of this class from the user's standpoint will, it is pointed out, be of value to customers in the selection of machines and methods.

TWO ROLLING MILL PROJECTS are interesting the citizens of Anderson, Ind. One of these is a sheet mill to manufacture Merchant Sheets and Black Plates for tinning, and the other is a rod and wire mill, probably in connection with the wire nail works of the Hszen Company.

KIECKHEFER BROS & Co., Milwaukee, Wis., will soon enter upon the manufacture of Enameled Ware, and with this end in view have commenced the erection of a $150,000 addition to their already extensive plant. They will manufacture Enameled Ware in all colors and styles. The new department will give employment, it is expected, to some 200 skilled workmen.

MILLER, SLOSS & SCOTT is the name of the hardware firm who have succeeded the late Huntington-Hopkins Company of San Francisco.

ON THE NIGHT OF MAY 3 the works of the Cincinnati Tin & Japan Company, Sycamore and Canal streets, Cincinnati, Ohio, were completely gutted by fire. The total loss is estimated at about $70,000, covered by insurance. The outside walls of the building, however, were not injured by the fire and the company will rebuild immediately.

CONDITION OF THE

Hardware Trade.

THE FINE WEATHER and the natural movement of trade have induced something of an increase in the volume of business from the retail trade, and many carefully assorted orders for small quantities are being received. Stocks are kept light, and buyers are avoiding purchases at all in excess of their early needs. The tone of the market causes a close adherence to this policy, it being recognized that prices on many goods are weak as well as low. There is accordingly little confidence in the stability of present quotations, even on such goods as have receded so far as to leave little probability of their further decline. Reports from the trade indicate that on the whole a healthful financial condition prevails. Although there is some complaint in regard to collections, there are few houses who are regarded as being in financial difficulties. Quotable changes in price are few, but there is a disposition on the part of both the producers and distributors of goods to make concessions when necessary, and on many goods there has been a perceptible settling in price during the past few months. There is thus an opportunity for buyers to exercise judicious care and skill in the placing of their orders.

Advices from Chicago.—Quite an improvement is noted in general business by the Shelf Hardware jobbers. The good weather of the past week has been favorable for outdoor work, and improvements are generally being made by farmers at this time of the year. Their demand is putting the country merchants in good condition to continually add to their stocks. The crop prospects are very flattering throughout the entire Northwest, and reports received from all quarters are now very encouraging to merchants in all the jobbing centers of this section. They are advising their correspondents to have no hesitation to lay in stocks of such goods as are in ready demand, having no apprehension that prices will be lower than are now current. Some lines of staple goods are very firm and show a tendency to advance. The coal strike is, of course, the most important element in this direction, but there are other influences at work which are expected to keep prices firm, if not to advance them. The jobbers in Tinware and House Furnishing Goods are not in quite so good condition as their Shelf Hardware brethren, and so far have experienced very little improvement in their branch of trade. The Heavy Hardware jobbers likewise report business quiet in their line, owing to the light demand from manufacturing establishments whom they supply with goods.

Notes on Prices.

Wire Nails.—The market is in substantially the same condition as last week, with perhaps a slightly firmer tone, on account of the uncertainty as to the effect of the strikes. As a result, manufacturers are not soliciting business so eagerly, and are not offering inducements so freely as a week or two ago. The volume of business continues good, though not specially heavy. It is made up for the most part of relatively small lots, but it is understood that some large buyers are in the market. Quotations for carload lots at mill are 95 cents up to $1, the former figure being usually obtainable. Small lots from store in New York are quoted at $1.15 to $1.25.

Advices from Chicago.—A good demand is reported for Wire Nails from points further west, and in some cases orders are coming in by wire. The city trade is less active than that originating in the country. Sales have been made by manufacturers at a slight advance over recent prices. Several factories are now known to have been stopped on account of the coal famine and others are expected to drop out during the present week. One of the largest concerns in this vicinity has therefore advanced its prices 5 cents per keg on Nails to be shipped from warehouse on account of the stoppage of the factory. Mill shipments are now firm at about $1.05 to $1.10, Chicago, with an advancing tendency. Jobbers quote small lots from stock at $1.10 to $1.15, but talk of advancing their prices at an early day, owing to the pressure from the mills.

Cut Nails.—The Cut Nail market also feels to some extent the influence of the labor troubles and the uncertainty as to their duration and effect. Prices are only slightly affected, the market being given a somewhat firmer tone in view of the fact that manufacturers are not disposed to make concessions as freely as heretofore. The Western price is about 90 cents for carload lots at mill. The price of Nails delivered in New York is 95 cents to $1 base, small lots from store being held at $1.10 to $1.15.

Advices from Chicago.—Manufacturers report a fair business during the week, with moderate sales to merchants in all sections of this immediate territory. While trade in this line has not been heavy it is as large as usual at this season. Prices are continued at 95 cents, Chicago delivery, on factory lots of 55-cent average. Jobbers quote small lots from stock at $1.05 to $1.10.

Barb Wire.—The demand for Barb Wire continues remarkably good for the season, and the volume of business is fair. The tendency toward irregularities in price has been checked somewhat by the uncertainty as to the outcome and effect of the strikes, and quotations continue with a slightly better tone about as last week. They are as follows for Four-Point Galvanized: Pittsburgh, $2.05 to $2.15; Cleveland, $2.10 to $2.20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.20 to $2.30.

Advices from Chicago.—Manufacturers have experienced a falling off in the demand recently, but the stoppage of some works on account of the Coal strike has apparently counterbalanced the restriction in trade and prices continue firm. Some manufacturers are advising their correspondents that an advance can be expected at an early day if the Coal strike does not soon terminate. Jobbers report a fair demand from stock. Quotations may be continued at $2.15, Chicago, for factory lots of Galvanized Barb Wire and $2.25 to $2.35 for small lots from stock.

Philadelphia Ice Chisel.—This article is manufactured by John Stortz & Son, 210 Vine street, Philadelphia, by whom it is sold to the trade at $2 per dozen net.

Nut Lock and Washer.—Horton, Gilmore, McWilliams & Co., 172 to 176 Lake street, Chicago, quote the following list on the Porter patent Combination Nut Lock and Washer, with a discount of 35 per cent. to the trade:

Size.		
3/12, 250 round, per pack.....	$5.00	per 1000
3/16, " regular, " "	5.00	" "
1/4, " " " "	5.00	" "
5/16, " " " "	6.67	" "
3/8, " " " "	6.67	" "
7/16, " " " "	6.67	" "
1/2, " " " "	8.35	" "
5/8, " " " "	8.35	" "

This Nut Lock is put up in a handsome antique oak counter case containing 21 pockets, holding about 4000 of seven sizes, assorted, and having extra pockets for ordinary washers as well.

Glass.—Manufacturers are still in an unsettled state of mind regarding the future of the Glass market, which uncertainty will not be relieved until the tariff question is settled; and under present conditions there is no incentive to store the product of factories. Demand appears to be equal to the present output of Glass, or so nearly so that stocks are not accumulating to any great extent in manufacturers' hands. It is too early to predict what effect the changes of rates in the Glass schedule of the tariff bill, as reported to the Senate May 7, will have upon the future Glass market if it passes in its present form. Pittsburgh factory quotations are reported as being 85 per cent. discount for single and 85 and 5 per cent. discount for double strength Glass. Present conditions indicate a favorable outlook for the Plate Glass trade in the near future, in anticipation of which additional factories are reported as preparing to start up. Quotations remain 70 and 10 per cent. discount for New York.

Old Metals.—The market for Old Metals is irregular, but prices remain at about their former level. Scrap Iron meets with somewhat slow sale in this vicinity. Dealers' purchasing price for Old Material is about as follows, delivered in New York:

Heavy Copper	℔	lb	7½¢
Light and Tinned Copper	℔	lb	6½¢
Heavy Brass	℔	lb	5½¢
Light Brass	℔	lb	4½¢
Lead	℔	lb	3¢
Tea Lead	℔	lb	2¢
Zinc	℔	lb	2¾¢
No. 1 Pewter	℔	lb	14¢
No. 2 Pewter	℔	lb	7¢
Wrought Scrap Iron....℔ gross ton	$9.00	@	....
Heavy Cast Scrap.....℔ gross ton	7.00	@	....
Stove Plate Scrap.....℔ gross ton	4.50	@	....
Burnt Iron, ℔ gross ton...	3.00	@	3.50

Old Rags, Paper, &c.—The demand has been good and prices fairly strong, as follows:

No. 1 White Rags	℔	lb	3¼ @	3½¢
No. 2 White Rags	℔	lb	2 @	2¼¢
Mixed Rags	℔	lb		2¼¢
Blues and 3ds	℔	lb	1 @	1¼¢
Hard Sized White Shavings	℔	lb	2¼ @	2½¢
No. 1 White Book Shavings	℔	lb	1½ @	1¾¢
No. 2 White Book Shavings	℔	lb	1 @	1⅛¢
Light Book Shavings	℔	lb		¾¢
No. 1 Mixed Shavings	℔	lb	¾ @	1 ¢
No. 2 Mixed Shavings	℔	lb	½ @	¾¢
No. 1 Printed Books	℔	lb	1 @	1¼¢
Ordinary Mixed Books	℔	lb	½ @	¾¢
Newspapers	℔	lb	2-5 @	½¢
No. 1 Manila Paper	℔	lb	1 @	1⅛¢
No. 2 Manila Paper	℔	lb	⅞ @	¾¢
Bogus Paper	℔	lb		½¢
Common Paper	℔	lb		⅜¢
Straw Chips	℔	lb		½¢
Binders' Clippings	℔	lb	½ @	⅝¢
Jute Butts	℔	lb	1⅞ @	2 ¢
No. 1 Jute Bagging	℔	lb	1 @	1¼¢
Mixed Bagging	℔	lb	¾ @	1 ¢
No. 2 Bagging	℔	lb	½ @	¾¢
Hemp Twine	℔	lb	2 @	2¼¢
Manila Rope	℔	lb	2⅛ @	2¼¢
Jute Rope	℔	lb	1½ @	1¾¢
Mixed Rope	℔	lb	¾ @	⅞¢

Old Rubber.—The market for this material is fairly active. Prices rule

about as follows, but are subject to change, according to conditions of sale and purchase:

Car Springs, ton lots, ℔ lb.	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb..	@	.03¼
Rubber shoes, less than carloads, ℔ lb.....	@	.03¼
Large Hose, ℔ ton.....	@	12.00
White Wringer Rolls, ℔ lb.	@	.03¾
White Syringes, ℔ lb	@	.03¾

Trade Notes.

THE EXCELSIOR STEEL FURNACE COMPANY, 38 West Monroe street, Chicago, advertise in this issue their machine made, double seamed, hot air Furnace Pipe, which they describe to be smooth as a bore, no solder, no buckling, air tight and dust proof. A coupon which appears as part of the advertisement will be accepted as the equivalent of $1 in payment for a first order of goods amounting to $10 or more.

THE JERSEY CITY GALVANIZING COMPANY, 28 Platt street, New York, will about May 16 move their office to 112 John street, New York.

CHARLES FAWCET of Sackville, N. B., is desirous of communicating with manufacturers of Cupolas, Tumbling Barrels, Polishing Mills, Emery Grinders, Lathes, Hoisting Gears, Circular Band and Jig Saws, Drills, Pulleys, Shafting, Hangers, &c., required in the complete equipment of a plant for Stove Plate work. He also desires to hear from firms supplying Nickel Plating outfits.

THE BOSTON WOVEN HOSE & RUBBER COMPANY, Cambridgeport, Mass., are distributing a little pamphlet illustrating their specialties. These include Cotton and Rubber Garden Hose, Rubber Belting and Packing, all of which are illustrated and described in a way to prove of interest and value to the trade. The company have offices in Boston, Chicago, St. Louis, Denver and San Francisco.

THE S. E. BARRETT MFG. COMPANY, manufacturers of Black Diamond Prepared Roofing, Roofing and Paving Pitch and coal tar products, 68 to 74 La Salle street, Chicago, have removed to rooms 909 to 914 Stock Exchange Building, corner of Washington and La Salle streets.

THE STARK MACHINE & TOOL COMPANY of Buffalo, N. Y., are favoring the trade with a catalogue of Tinners' Machines and Tools, Presses, Dies and Machinery for working sheet metal. It is a volume of something like 90 pages, profusely illustrated and bound in colored paper covers. The company refer to it as the tinners' edition of their illustrated Catalogue A No. 2, which, however, does not include all the articles which they produce. Ample descriptive letterpress is provided in connection with the numerous illustrations, so that those in want of goods of this character can readily learn of the merits claimed for them. Prices are also given, as well as an index arranged alphabetically. The company state that in addition to the Machines and Tools shown in this catalogue they manufacture a full line of foot, draw, power and double crank Presses, foot and power Crimpers and Squeezers, Double Seamers, Bending Machines and Dies of every description.

THE GEUDER & PAESCHKE MFG. COMPANY of Milwaukee, Wis., offer in their advertisement to supply dealers who purchase a quantity of the Cream City Flour Bin and Sifter with copies of a handsome booklet on the subject for distribution among their customers. We have received from the company a small pamphlet entitled "A Few Testimonials," in which are collected specimens of letters received from those who have used the Bins.

JAMES W. ROSS, room 647 The Rookery, Chicago, shows superb samples of the galvanized sheets now being made by the Whitaker Iron Company of Wheeling, W. Va. The crystallized surface is remarkably handsome, the coating is perfectly smooth and it adheres tenaciously to the body of the sheet, which is of very soft but tough steel.

SCRAP.

NORTON BROTHERS of Chicago are negotiating for the purchase of a part of the output of the Ellwood Tin Plate Company, Ellwood City, Pa. The plant of this concern was recently put in operation and will manufacture black sheets for tinning purposes. The concern have a four-mill plant and will give employment to about 100 men when in full operation.

WE LEARN from Nathan A. Taylor of the firm of N. & G. Taylor Company, Philadelphia, who was in this city last week, that their works are very busy at the present time, and their 19 pots are at present all in operation. A majority of the pots are making terne plates, but some six of them are operating on bright plates. Messrs. Taylor & Co. enjoy an excellent demand for their goods, and make it a point to keep on hand a full assortment of all sizes to meet the wants of their customers.

THE NEW ROLLING MILL of the Baltimore Iron, Steel & Tin Plate Company, at Baltimore, Md., is now in operation, giving employment to 70 additional hands and increasing the weekly output from 1200 to 1800 boxes. It is said to be the purpose of the company to build three additional mills at once, each of which will have a capacity of 600 boxes a week. They will be equipped with the most approved appliances and will cost about $40,000.

EXPORTS OF TIN AND TERNE PLATES from Great Britain in the month of April were 24,000 tons, against 39,000 tons in April, 1893. Of these amounts shipments to the United States were 13,000 tons and 31,000 tons respectively.

OPERATIONS AT THE new tin plate works of Meurer Bros. Company, Flushing avenue, Brooklyn, are proceeding with abundant success. Six pots are now installed and in regular work, turning out an average of 1700 boxes of tin and terne plates weekly. Three more pots are to be added within a short time. Messrs. Meurer have succeeded in producing coke tins and roofing plates of a quality that compares exceedingly favorably with imported material of a similar grade, and their product has been so favorably received by the trade that their orders exceed the present capacity of production. As yet the works have only been running during the day, but a night shift will shortly be put on, thereby doubling the present output. An electric light plant is being installed for this purpose. Four of the tinning machines now in use are of the Thomas & White pattern, two of them being employed on bright and two on terne plates. The other two machines are of the Phillips type and are used for ternes. Each is furnished with a cleaning machine and a dusting machine is provided for every three pots, so that the handling of the plates is carried out with the greatest rapidity. An automatic steam pickling machine is about to be added, as well as a steam shearing machine. In addition to their regular guaranteed plates, Meurer Bros. Company are now making three qualities of ternes, named respectively Grace, Superior and Standard, as well as Brooklyn coke tins and Florence charcoal tins.

THE TIN PLATE WORKS to be erected at Washington, Pa., by a strong company of New York capitalists, in conjunction with N. E. Whitaker of Wheeling, W. Va., will be a notable addition to the American tin plate manufacturing industry. In addition to rolling mills of ample capacity for the production of black sheets, the tinning department will be one of the largest in the country, including 18 stacks. Work on the buildings will, we understand, be inaugurated at an early date.

G. T. Ewers, 1314 Dolores street, San Francisco, Cal., distributes a circular directing attention to the patent gas burner that he has invented. A feature of it is that that burner closes automatically and there is no danger from the gas being blown out ignorantly or accidentally.

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Metal and Miscellaneous Prices.

CHICAGO, MAY 10, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @ $5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100℔	.5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	.11.50 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC,10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	.. 6.12½@ .....
IC, 20 x 28	..12.25 @ .....
IX, 14 x 20	.. 7.62½@ .....
20 x 28	..15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal ,extra. IC, 14 x 20.... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood —IC, 14 x 20.....$6.00
IC, 20 x 28.....12.50

Roofing Plates.

Palm, IC, 20 x 28.....@$11.25
Palm, IX, 20 x 28.....@ 14.00
Empire, IC, 20 x 28.....@12.00
Empire, IX, 20 x 28..... @15.00
Hickory, IC, 20 x 28.....@ 12.50
" IX, 20 x 28.....@ 15.50
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 15.00
" IX, 20 x 28.....@ 18 00

Westmoreland:
IC, 14 x 20..... $6.00
IC, 20 x 28..... 12.00

Elwood:
IC, 20 x 28..... $11 50

Furmston:
IC, 20 x 28..... ...$11.00

Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50

Illinois, Old Method:
IC, 20 x 28.....$17.00

E. L.:
IC, 20 x 28.....$12.50

Jessie:
IC, 20 x 28.....$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20..... .....$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 .....11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28.....19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28.....22.00
Neville, Stamped, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28.....12.50
" " IX, 20 x 28.....15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared).....$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared).....19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared).....16.50
Columbia, IC, 14 x 20 (Stamped)..... 7.25
" IC, 20 x 28 (Stamped)....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28.....13.00
Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28.....12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 .....12.00
Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28 .....12.00
" IX, 20 x 28.....16.00
" (Redipped), IC, 20 x 28.....17.00

Old Process:
IC, 14 x 20..... ..... 9.25
IX, 14 x 20.....11.25
IC, 20 x 28.....18.50
IX, 20 x 28.....22.50

H. B. L., Old Style:
IC, 14 x 20..... ..... 7.75
IX, 14 x 20..... 9 25
IC, 20 x 28.....15.50
IX, 20 x 28.....18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 3-10¢	3 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5-10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis.75@5%

Copper—

Ingot.

Lake.....10½¢ @ 11¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)
Discount, 40%.

Plain, ¾ inch up to 2 inch	.....$0.35
Plain, ⅝ inch up to ¾ inch	.... .35
Plain, ½ inch up to ⅝ inch	..... .38
Plain, ⅜ inch up to ½ inch	..... .41
Plain, 5-16 inch up to ⅜ inch	48
Plain, ¼ inch up to 5-16 inch	..... .65
Plain, 3-16 inch up to ¼ inch	..... 1.00
Plain, ⅛ inch up to 3-16 inch	.... 1.50
Plain, 2 inch up to 3 inch	..... .38
Plain, 3 inch and larger	.....Special.
Plain, smaller than ⅛ inch	.....Special.
Bronze and Copper	.....3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)
Discount, 40%.

Slab Spelter—

Western Spelter..... .... 4¢

Sheet Zinc—

600 ℔ casks..... .....4.50¢
300 ℔ casks.....4.70¢
Loose sheets.....4.80¢

Lead—

Soft Pig Lead.....4 ¢
Bar.....
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....13¢
Hallett's.....12¢

Wrought-Iron Pipe—

1¼ and under, Plain.....60&10%
1¼ and under, Galv.....52½&10%
1½ and over, Plain.....70&10%
1½ and over, Galv.....60&10%
Boiler Tubes, list Oct. 24, 1892.....70&10%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....55¢
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.50 square
Climax.....$3.35 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.50 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ D, 2 ¢
" " Brown.....℔ D, 1½¢
" " Purple.....℔ D, 2½¢
" Ground in oil, B. Red ℔ D, 6½¢
" Ground in oil, Red..℔ D, 6½¢
" Ground in oil, Brown ℔ D, 5½¢
" Ground in oil, Purple ℔ D, 6 ¢
Linseed Oil, Boiled, in bbls.....54¢
Linseed Oil, Raw, in bbls.....51¢
Mineral Paints.....2@4¢
Orange Mineral.....9½¢
Pure White Lead in Oil.....6@6½¢
Dry White Lead in bbls.....5½@5¾¢
Red Lead, American.....6@6½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ℔ gal..... .34¢
Spirits Turpentine, in bbls., ℔ gal..34½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, MAY 11, 1894

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:,
Small lots.....℔ D, 75¢
100-℔ lots.....℔ D, 73¢
Ton lots.....℔ D, 70¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....℔ D, 65¢
100-℔ lots.....℔ D, 60¢
Ton lots.....℔ D, 55¢
No. 2 grade (guaranteed to be over 94% pure Alu ℇ num), cast in ingots for remelting:
Small lots.....℔ D, 60¢
100-℔ lots.....℔ D, 55¢
Ton lots.....℔ D, 50¢

Antimony—

Cookson.....℔ D, 10¾¢
Hallett's.....℔ D, 9¾¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List April 9, 1894.

Plain Round Tube.	Per ℔.	
¾ in. up to 2 in.	$0.35	25 @ 30%
⅝-in. up to ¾-in.	.36	
½-in. up to ⅝-in.	.38	
⅜-in. up to ½-10	.41	
5 16-in. up to ⅜ in.	.48	
¼ in. up to 5-16-in.	.65	
3-16 in. up to ¼ in.	1.00	25
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger.	Special	
2¼ in. to 3 in., to No. 16, inclusive,	.38	

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

*Bottoms, Pits and Flats..*19¢ ℔ D, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10 ¢
Ansonia Grade Casting.....9¼¢
Planished.....net
Sheet and Bolt.....15¢ ℔ D, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2.50	2.80¢
Nos. 17 to 21	℔ D. 2.60	2.90¢
Nos. 22 to 24	℔ D. 2.70	3.00¢
Nos. 25 and 26	℔ D. 2.80	3.10¢
No. 27	℔ D. 2.90	3.20¢
No. 28	℔ D, 3.00	3.30¢
American B. B	℔ D, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11½@12½¢
Patent Planished ℔ D. A, 10¢ · B, 9¢ 5%
Craig Polished Sheet Steel.....℔ D 8½¢

Galvanized.

	B. B	
Nos. 10 to 16		75 @ 76&10%
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Lead—

American Pig.....3½¢@4¢
Bar.....4½¢
Pipe.....5¾¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6¾¢, 20%
Old Lead in exchange, 2¾¢ ℔ D.

Metal Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....30%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil..... 6¾ @ 7½
Lead, Red, bbls. and ½ bbls... 6½ @ 7
Lead, Red, kegs..... 6¾ @ 7
Ocher, American..... 1 @ 1½
Red Venetian, American..... 1½ @ 2½
Linseed Oil:
Raw, ℔ gal..... .. @ .40
Boiled..... .. @ .43
Spirits Turpentine:
In bbls..... .. @ .32
Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01¾ @ .02¼
In bladders..... .01¾ @ .02¼
Roofing Material, &c.:
Asphaltum, Trinidad Refined, ℔ ton.....$30.00@$35.00
Asphaltum, Rock, ℔ ton.....$14.00
Coal Tar Felt, 1 Ply, ℔ ℔..... .2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft. $1.85
Roofing Pitch, ℔ bbl..... $2.25

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, May 19, 1894.

DAVID WILLIAMS, - PUBLISHER

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CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Cheap Heating.

We are now at the season when winter heating apparatus of all kinds goes out of service. A good deal of it, in the natural order of trade, should have gone finally out of service last year; but in view of the panicky feeling which prevailed and consequent attempts to secure unusual economies, it has been made to hold over by various shifts and devices against the desire for newer and better apparatus. Those who find themselves at the end of the heating season with worn out boilers or furnaces will do well to consider at once whether there will ever come a more favorable time for replacing it. All sorts of goods seem to have settled down upon the very bed rock price; and contracting firms with comparatively idle facilities are not only looking around very sharply for more work but are willing to execute contracts at prices quite unprecedented in the trade. It is believed by many that heating contract work will be done in this summer of 1894 more cheapily than it will be possible to get such work done for many years to come. Besides, a worn out heating plant is not economical of money, comfort or health; and when such plants have reached a certain stage of decreptitude they ought to be summarily replaced by new installments.

Good Time for Renewals.

Especially should apparatus for heating schools, churches or assembly rooms be carefully scrutinized now for the discovery and removal of any defects. Such installments usually cost more than domestic heating arrangements; and if it be now necessary or desirable to make expensive repairs or to renew boilers or furnaces the present state of the market is well worth considering by school boards and committees. School heating and ventilation apparatus when out of order exert a deleterious influe ce upon health, especially in overcrowded school rooms. It is almost a crime to neglect the restoration or supply of anything needful for the effective warmiug and ventilating of school buildings, yet many boards and committees are apparently heedless of the state of school buildings under their charge. This indifference, we are glad to say, has been replaced by active interest in many localities during the past few years. But there still remain men who seem to regard a school as a kind of charity institution to be maintained at the lowest possible cost, regardless of sanitary requirements. But if lowest possible cost be now auywhere the controlling motive, and the time has arrived for renewals or repairs, there will not soon be another season in which work of the kind required for schools can be secured at as low a price as it cau probably be secured during the coming summer.

Railroad Progress.

The twenty-fifth anniversary of the completion of the first all rail line across the American continent, which occurred last week, brings to mind the phenomenal progress in railroad building and railroad traveling that has been made in this country during the past quarter of a century. In 1869 there were 47,254 miles of railroad in existence in the United States, while on January 1, 1894, there were in operation 175,223 miles of track, or nearly four times as much. The enormous advance which has developed in the interval in speed and safety, and in the conveniences and facilities of travel, as well as in the rolling stock and general equipments of the roads, is still more remarkable. The number of the traveling public, too, has increased in a still greater ratio thau the railroad mileage siuce the golden spike was driven on May 10, 1869, marking the completion of the first great American transcontinental line. Since that day four more roads have stretched themselves across the continent from ocean to ocean, while others are now in contemplation. What another 25 years may bring forth in the field of railroad progress can only be imagined.

The Cost of Necessaries.

In these times, when the majority of people in the United States are suffering from reduced incomes or shrunken business profits, and when the earnings of workers have decreased, or are temporarily suspeuded by reason of lack of employment, it is some compensation to kuow that never before did it cost so little to live. Food and clothing—the necessaries of life—in particular, have never been so cheap as they are at the present time. So that, while luxuries and superfluities may in many homes have been ruthlessly cut down during the past year of depression, there has been happily little reason for painful retrenchment in the absolute necessaries of existence. The following table, compiled by the *American Grocer*, showing the quantity of different food products which $100 would buy at wholesale rates at different periods for the past 32 years, clearly illustrates the downward tendency of prices for these necessaries:

	1862-67.	1872-77.	1882-87.	1894.
Tea, Japan, ℔...	137	244	454	500
Sugar, ℔.....	606	894	1,333	1,848
Mess beef, bbls..	7	8 2-5	8 2-5	13
Mess pork, bbls.	4.2	5.5	6 6	8.7
Lard, ℔.....	666	909	1,143	1,579
Coffee, ℔	367	518	993	551
Flour, bbls.....	13.7	16.1	15.1	19
Corn, bush.....	120	141	166	175
Bacon, ℔.....	752	990	1,042	316
Butter, ℔.....	294	300	370	351
Molasses, gals ..	188	285	392	800
Rice, ℔.....	800	1,111	1,540	1,750
Starch, ℔.....1,052		1,063	2,273	2,666
Soap, ℔.....	1,000	1,470	2,000	2,500
Potatoes, bush..	98	120	125	154
Salmon, canned, dozen	25	63	85	77
Tomatoes, can'd, dozen.....	40	48	93	108
Corn, canned, dozen.....	33	45½	100	111

Coffee is the only generally used article that shows any material advance. Clothing of the ready made kind may now be purchased at prices which for cheapness compare favorably with those of Europe, and which a few years ago would have been thought chimerical.

The State Department has just issued a series of recommendations from various United States Consular Agents in South Africa regarding the packing of goods for export to that country. Among other advice, the opinion is generally expressed that all goods liable to damage by weather should be packed in cases lined with tin and not merely with water proof paper, the latter not being sufficiently proof against the heavy rains of South Africa. The complaint is also made by importers that oil cases sent from the United States are too flimsy and should be made of heavier tin, in order to stand the rough treatment incidental to the carriage of these goods overland by ox wagons and other primitive methods of transportation.

A high tower is to be constructed at Fredericksburg, a suburb of Copenhagen, by Colonel Somefeldt. It will be 600 feet high. The Danish Minister of War has reserved the right to use the top as a military observatory.

What will be the largest dry dock in the world is now building at Southampton, England. It is to be 800 feet long, 110 feet wide, and will have 27 feet of water over the sill.

THE LETTER BOX.

What Causes Siphonage?

From P. LUMBER, *Connecticut*.—In answer to "Inquirer" in *The Metal Worker* of April 28 as to the cause of siphonage of the fixtures shown and described, I would give the following explanation:

When the closet is flushed it has to draw its supply of air from the vertical 2-inch pipe. It draws with equal force on the contracted 1½-inch horizontal line, or possibly with greater force. When the flushing water reaches the 4 x 2 Y it acts as a piston of a pump and draws the air from the horizontal 2-inch waste pipe, making the second and combined cause of siphonage of the traps of both the bowl and the bath. I would overcome this difficulty by making a separate 2-inch connection from the water closet direct with the vertical air pipe.

Defective Draft.

From J. F., *Willimantic, Conn.*—In *The Metal Worker* of May 5, "W. S." inquires what caused the trouble with a chimney that is 4 x 12 inches, inside measurement. One trouble is that the flue is too narrow. Flues should never be less than 8 inches wide. Twenty-five years as a mason have taught me something about building chimneys. A flue should never be less than 8 inches square, or better 8 x 12, and should be plastered smooth inside. If there are any extra openings for a stove they should be shut when the stoves are removed. I was called to examine a chimney recently, and found three fire places in the chimney. They were closed up with wooden fire boards and the owner thought they were all tight, but in one room there was a bureau against the fire place, and on removing it I found that the fire place had some time caught fire and had a large hole burned in it. It was a wonder that the house was not destroyed. After bricking up this opening the stove which had failed to prove satisfactory operated with excellent results. My customer paid the bill and said it was the best investment he had ever made of his money. Every mason knows that a chimney should be higher than the adjoining buildings or it will be affected by a wind blowing across or possibly down it.

Patterns for Portable Bathtub.

From A. G. K., *Lucknow, Ont.*—I would like to be informed how to obtain the patterns for a portable bathtub, flaring at each end, using trammels or compasses for obtaining the patterns.

Answer.—On page 98 of "The Metal Worker Pattern Book" is presented the method of obtaining the patterns of an oblong tapering article, one end square and one end semicircular, having more flare at the ends than at the sides. The pattern of large end of article is derived from the frustum of a scalene cone, and the method shown for obtaining the patterns will probably fulfill our correspondent's requirements.

Choked Water Backs.

From E. J. Y., *Regina, N. W. T.*—Will *The Metal Worker* inform me of some way to get over my difficulty with hot water connections on kitchen ranges in this locality? We have three ranges connected with upright boilers in the usual way, only in place of water backs we have 6 or 8 feet of 1-inch pipe in a coil over the fire. These pipes block up with a solid coating of a flint like substance in from two to six months, and then burst open. One customer has decided that the expense of renewing is too great, coming as it does every couple of months, and has had the coil taken out permanently. The other customers have their taken out regularly every two to six months. The pipes do good service when clean, heating the water quickly when used. The water used is taken from deep wells on the premises and has some alkali in it.

Answer.—It is needless to point out to our correspondent what he already knows, that the difficulty is the alkali in the water, and that the incrustation in the coils is similar to that which takes place in steam boilers and which is such a prolific source of trouble and expense. For power boilers there are many so-called boiler compounds, the purpose of which is to soften the incrustation by changing its nature, and then when it is in a removable condition the boiler is blown off, cleaning it out. Such applications, however, are entirely impossible in the present case, for the boiler compound would make the water unsuitable for domestic purposes. Our correspondent has to meet this difficulty—that is, the incrustation of a foreign substance on the heating surface—and it remains to be seen how this trouble can best be lessened, for it cannot be avoided. Our suggestion is to make the coils of very much larger pipe. One inch is needlessly small, and while this size gives good quick results through the extended heating surface when the pipes are new, there is but little space to block up with the deposit. Two-inch pipe is small enough for the purpose, and experiments might even be made with larger pipes. By the use of pipe of 2½ inches diameter, for instance, it is evident the choking process will extend over a much longer period of time. On the other hand, it must be remembered that the deposit is a very bad transferrer of heat, and the efficiency of the coil will continually decrease, so that after the pipe has, for instance, a ¼-inch coating on the inside it will transfer heat very sluggishly to the water. This, however, is the best suggestion we can make, for we presume without inquiring that it is impossible to secure a better water supply. Of course, if rain water could be stored and used for the purpose the difficulty would be solved at once. We would like to hear from those of our readers who have had experience with hard waters in kitchen boilers and water backs.

Square and Angle Miters.

From W. D., *Hoboken, N. J.*—Please publish the pattern for angle miter of cornice. I understand square miter, but cannot make profile so as to describe angle miters.

Note.—Our correspondent's difficulty probably arises from the fact that he has learned to draw square miters by the short method—that is, without the use of the miter line. When the miter line is at 45° there is no need of dropping lines to it from the profile and then to the stretchout, for the result is the same as if dropped direct from the profile into the stretchout. When the miter line is other than 45° it is necessary to make use of a plan. Our correspondent will find this method fully and clearly explained on pages 68 and 69 of "The Metal Worker Pattern Book."

Water Pressure.

From W. H. F., *Washington Depot, Conn.*—Please give me through the columns of *The Metal Worker* some rule for ascertaining the pressure in a water main, the fall and size of pipe being given.

Answer.—The rule for finding the pressure of water is to multiply the hight in feet by 0.43, the result being the pressure per pound in square inches. This is the rule that we would recommend to our correspondent, but at the same time we must point out that there are many minor factors omitted. If the water is flowing through a pipe and the pipe is of small diameter the friction will decrease this pressure. The condition of the inner surface of the pipe will also affect the pressure, a rough pipe making more friction. Sharp bends must also be taken into account. We assume, however, our correspondent merely wants a general rule, and the one above given will probably answer his purpose.

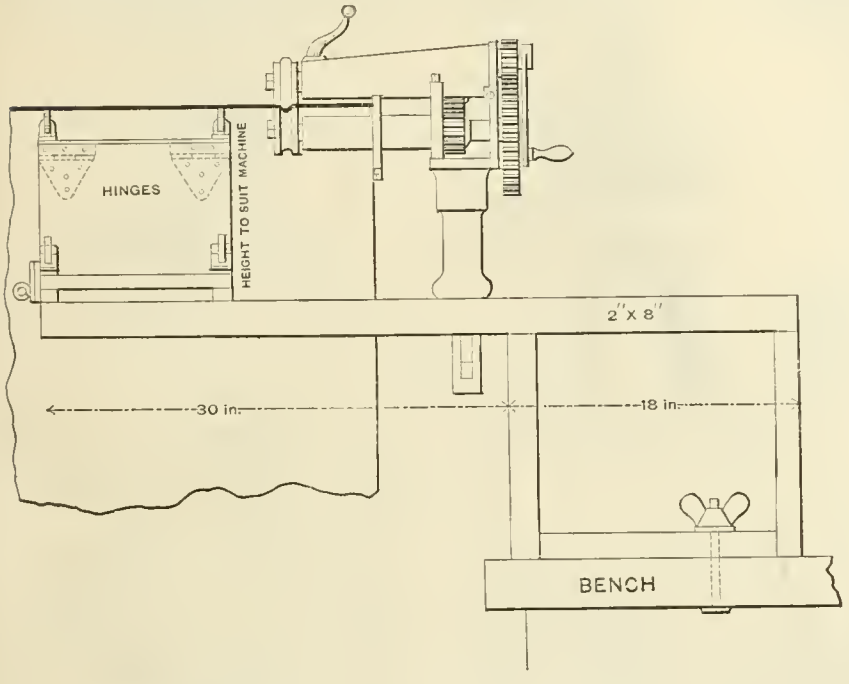
Fire Place Smokes.

From I. G. L., *New York City.*—In reply to the inquiry of "J. A. S.," in *The Metal Worker* of May 12, he can

overcome his trouble to a large extent by stopping off the chimney just below where the flue from the grate enters it.

Swedging Large Furnace Bodies.

From J. J. F., *New York.*—Some of the readers of *The Metal Worker* who swedge large furnace bodies may appreciate what a valuable assistant is found in a device of which I send you an illustration and description. Bodies of from 40 to 60 inches in diameter can be readily swedged by one man when it is used. Mine is arranged to bring the point between the rolls 52 inches above the floor. This is done by setting one end of an oak plank 2 inches thick, 8 inches wide and 4 feet long, on a base made of strong boards, as shown in Fig. 1. The base should be as wide as the plank and about 18 inches long, and should set on the work bench and be fastened to it at the back end by two bolts long enough to go through both and having wing nuts. A hole should be cut in the plank for the swedging machine stand. The hight of the base must be sufficient to make the 52 inches when added to the hight of the work bench and the machine, and if braces are put on each side of the base it will be stiffer. At the outer end of the plank place a piece of inch board 1 foot long and 4 inches wide, supported by two tapering uprights. On each end of the 4-inch strips put a universal caster. The hights of the supports should bring the top of the casters level with the point where the rolls meet and they should be on a line with the roll shaft. On each side of the top strip hinge a piece of board 12 inches wide and 15 inches long and put a universal caster on each of the outer end corners. To each of the hinged boards fasten a piece of iron $\frac{3}{16}$ x 1 inch and 15 inches long by means of a round head screw through a hole in the iron. To let one iron work smoothly on top of the other, a piece of the iron 1 inch square with a hole in it should be put under one of the irons where it is fastened to the hinged board. In the other end of the iron drill $\frac{1}{4}$-inch holes $\frac{3}{4}$ inch apart for half its length. Put a $\frac{1}{4}$-inch hole in the front upright near the bottom and have a $\frac{1}{4}$-inch pin 4 inches long with an eye at one end so that it can be fastened by a cord to the upright. By placing the pin in the holes in the iron and upright, the hinged board can be supported at any hight to make the casters carry heater bodies of different diameters.



Swedging Large Furnace Bodies.—Fig. 1.—*Showing Side View of Apparatus.*

Pearl Gas Stoves.

From R. & B.—Will some one please tell us the address of the makers or New York agents of the Pearl gas stoves?

D. R. Brownlow, Middletown, Conn., has brought out the Perfect curling iron heater and lamp stove. This little device consists of a steel spring support for fastening to the top of a lamp chimney and above it is a heater into which the curling iron is placed. It is arranged so that there is an outlet for the hot gases and surplus heat, thus not interfering with the lamp flame. By opening the cover the stove can also be used for heating and cooking purposes.

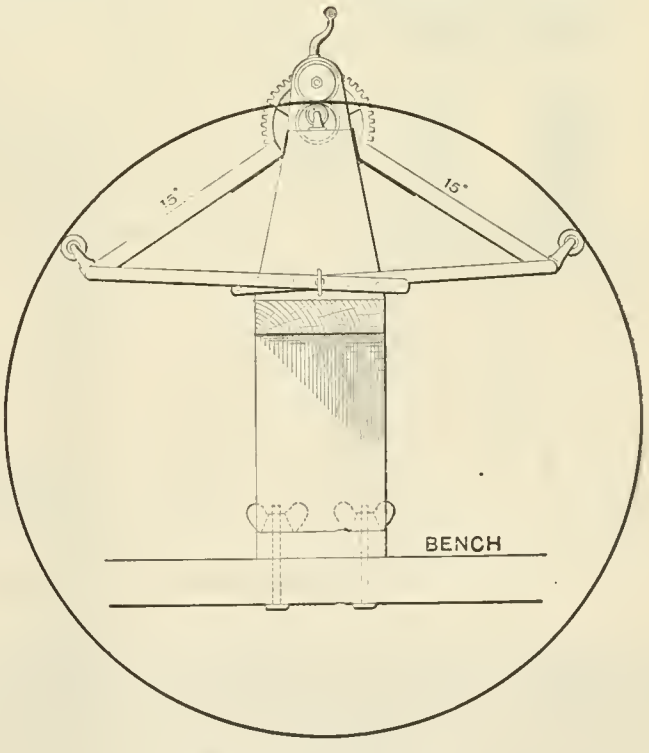


Fig. 2.—*Showing End View.*

Metal Work in India.

The following extract from the "Directory of Indian Manufactures" for 1894, published by the *Indian Textile Journal*, contains some interesting information in regard to the brass and copper works of India: "On account of national and religious customs, brass and copper vessels for cooking, eating, or drinking are to be found in every house, and the workers in those metals are more numerous than those in iron. The hollow ware is nearly all made of imported sheets, which are hammered and brazed into shape. The vessels used for cooking are tinned inside. Brass founding is generally done on a small scale, and a good deal of door, window and other furniture is thus made. The capital towns possess a few larger foundries, which turn out rough hinges and other articles very cheaply. Brass hinges are much used in India on account of the destructive effect of the monsoon rains upon iron hinges, which are never oiled. These foundries have none of the system by which labor is expedited and cheapened as in Europe; gauges and templets are unknown and accuracy ignored. A glance at the import lists of brass work alone would show that a well organized brass finisher's shop would pay a better profit on its capital than any engineer's workshop. There is also a considerable business in hollow ware of hammered sheet iron most skillfully riveted and brazed together. It is much more durable than the imported galvanized iron bucket. The whole of this work is done by hand labor, without the assistance of any stamp or press. Machines were once tried in a Bombay workshop, but as the inferior sheet used would not bear the process, it was abandoned. The experimenter did not know that better sheets were needed for stamping than for working with the hammer. Machinery has thus been condemned as a failure for this particular purpose in Bombay."

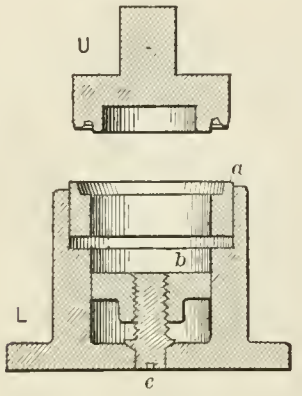
Press Working of Sheet Metals.—VI.

BY OBERLIN SMITH.

Curling Process.

Somewhat analogous to forming processes, but involving a new principle not yet herein touched upon, is the operation of "curling" or "wiring," with its various modifications. The two words just quoted as names for this process are used synonymously, although it would be correct to confine the term "curling" to the operation of putting a curled edge upon the top of a pan, cup or other vessel without any wire inside of it, this being often spoken of as imitation wiring. The man who first called it simply "wiring" must have had in mind the boy who took to market an "empty bag with potatoes in it." Real wiring is the same process when done around a ring of wire, which, of course, stiffens the vessel very much more than does the bastard process before mentioned. The latter, however, is cheaper and easier to perform, and often answers a sufficiently good purpose. In Fig. 185 is shown, in vertical axial section, a pair of outside wiring dies for cylindrical work, such as tin cups, dinner pails, &c. This process, it should be mentioned, is usually confined to thin metals like tin plate, sheet iron and sometimes brass and copper, all of which are usually less than $\frac{1}{32}$ inch thick. In such tools the lower die L serves mostly as a receptacle for the work, while the upper die U does the actual curling. Were the dies in question for curling only the loose ring *a* (which is driven to the upward position shown by suitable springs and limited therein by proper stops) might be omitted, the top of the die being solid, as in Fig. 189. As it is, this ring is used to support a wire ring, Fig. 186, which is laid loosely around the top of the uncurled work, Fig. 187, and which creeps down as ring *a* descends by the action of U. At *b* is shown an adjustable bottom upon which the work rests and which is regulated by the screw *c* or its equivalent. This construction enables the same die to be used for various hights of work. In cases where but one hight is required this bottom is made in a solid piece with the rest of the die, as in Fig. 189. In Fig. 188 is shown the finished work as curled without containing the wire ring, such dies being available for making it either with or without the same.

In Fig. 189 is shown a pair of curling dies for outside curling upon the large end of conical or tapered work, such as is shown uncurled in Fig. 190 and curled in Fig. 191. It is suitable for dish pans, milk pans, sauce pans, buckets and such like work. Should it be desired to put in a real wire, the top of



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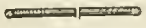
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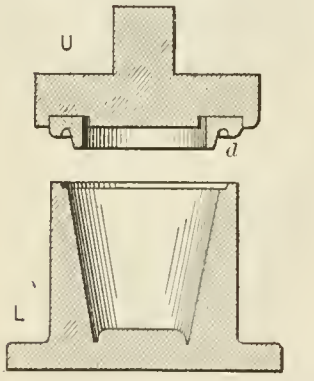

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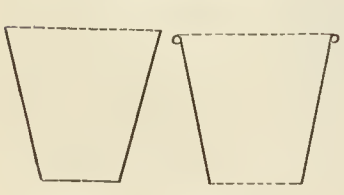
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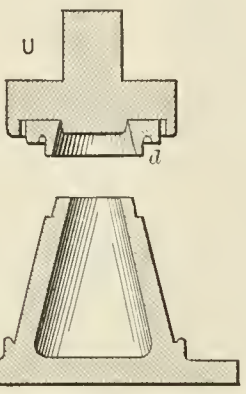

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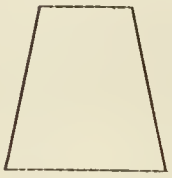
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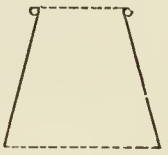
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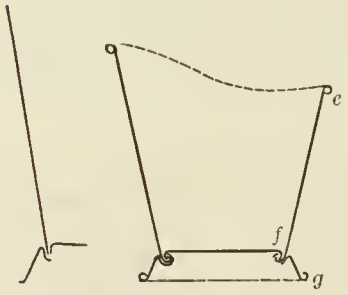

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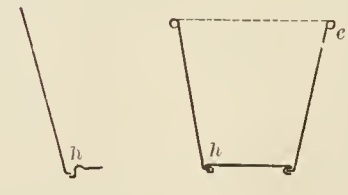

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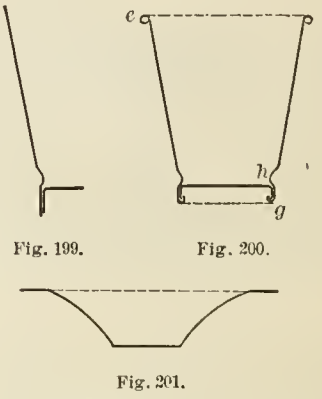

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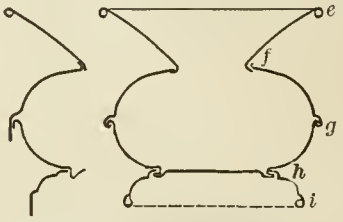

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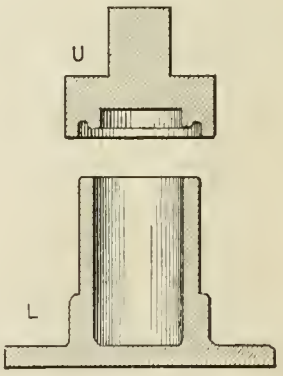

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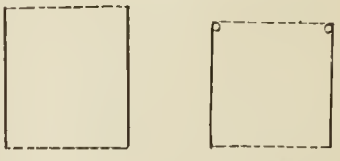
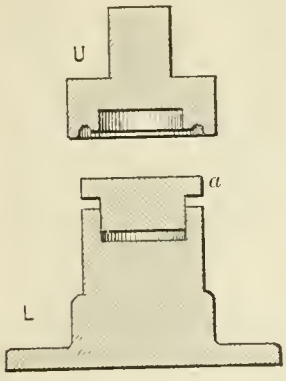


Fig. 205. Fig. 206.

die L is supplied with a floating ring, ss at *a*, Fig. 185. In tapered work like this it is evident that the curling, as it successively passes through the differ- of the tapered work. It is therefore necessary that the curling ring *d* should be detached from the remainder of the upper die, that it may gradually de- being sawed apart radially into perhaps six or eight pieces. These are, of course, properly supported in the main body of U, and are supplied with



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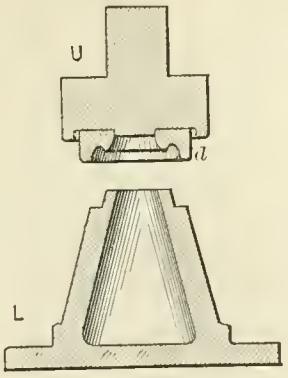

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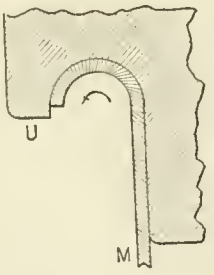

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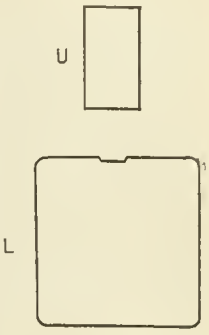

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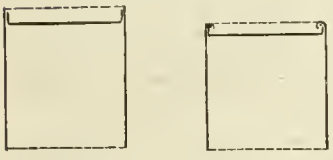
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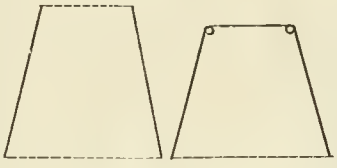
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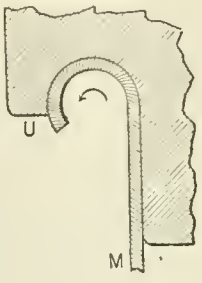

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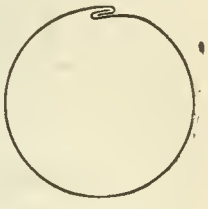
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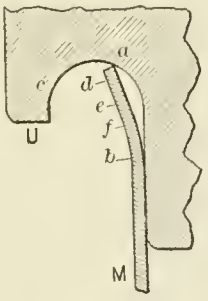

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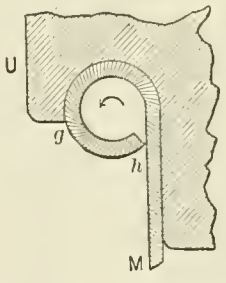

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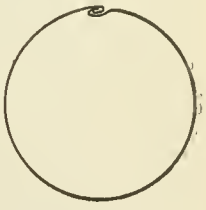
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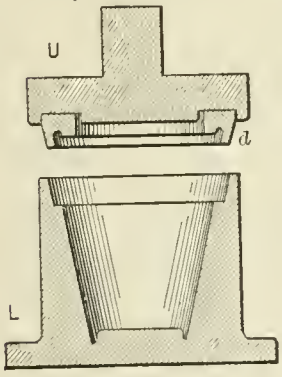

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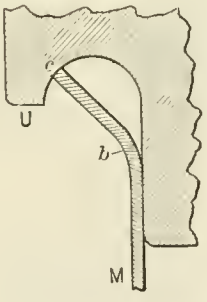

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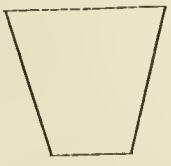
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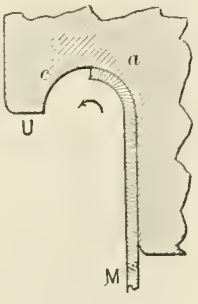

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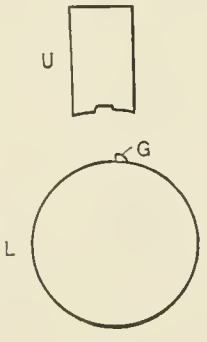

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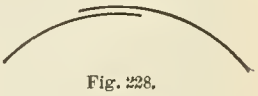
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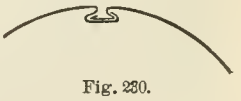


Fig. 230.

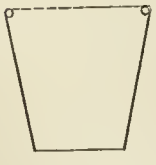


Fig. 212.

PRESS WORKING OF SHEET METALS.

ent stages shown in Figs. 218 to 221 inclusive, must grow smaller in its general diameter, as it creeps down the cone to smaller and smaller diameters crease its diameter as it goes downward in doing its work. That it may thus become a contracting ring, it is made in a number of sections, usually springs to drive them outward as they ascend, so that they will be ready for the next piece of work. It is found in practice that such rings are sufficiently

elastic to approximate nearly enough to a true circle as they are forced into the lower die, and that the slits, if narrow enough, do not injuriously mark the work. The work shown in Fig. 191 fairly represents the body of an ordinary sheet iron bucket. These bodies are usually made up of one or two or more sections, seamed together in lines forming elements of the cone.

In Fig. 192 is shown a pair of dies which are the exact reverse of those just described. They are for curling the small end of conical work, as shown in uncurled and curled conditions in Figs. 193 and 194 respectively. In general, it is found better to confine the work outside for outside curling, and it is therefore placed within the lower die, as a receptacle, in the two former cases above mentioned. In this case, however, it is evident that the work could not be gotten into and out of such a die unless it opened in halves, but experience has proved that work of the kind here shown (which, by the way, fairly represents coffee pot bodies and such like articles) can be successfully curled after being slipped over the hornlike lower die pictured in Fig. 192, which seems to brace the body against buckling better than with straight work, &c. This and other dies of the same bulky character are made hollow merely to save metal, but could, of course, just as well be solid. The curling ring *d* has in this case an expanding rather than a contracting action, and is forced inward by springs, instead of outward, as in Fig. 189. It of course expands automatically as it is driven down upon the work.

In Figs. 195 to 203 and also in Figs. 208 and 209 are shown specimens of what may be called the curiosities of curling. They are combination processes, where two or more pieces, previously made of the proper shape, are assembled and fastened together, as well as given a suitable finish by various operations of curling, &c.

In Fig. 195 are shown the uncurled body, bottom and base ring of a patent coal scuttle, one side only being given and that in "slice section." In Fig. 196 the same are shown in complete section after being curled at one operation, the dies at the same stroke curling the top rim *e*, the triple joint *f* and the bottom rim *g*. Dies for such work are of course very difficult to make, especially as the top of the vessel does not lie in a normal plane, nor in a plane at all, being of the double spiral shape shown. It is, moreover, necessary to use self acting outside clamps to clamp the body securely to the horn, and also to embody vertical motions of the horn itself, and of a clamping device to hold the bottom and base ring in place.

In Figs. 197 and 198 are shown two similar stages of the operation of curling the top of a bucket and putting a bottom thereon, the latter, however, not being a curling operation, but rather a peculiar style of forming, where an upwardly projecting bead in bottom, *h*, is forced to bulge and bend over outwardly by the pressure brought upon it at the same time that the top curling is being done.

In Figs. 199 and 200 are shown similar stages of the operation of putting the bottom in a pail by a different method, consisting of double curling them together at *g*, while the top curl is being made at *e*. In this case a depression, *h*, has been made in the body in some kind of a roller forming machine.

In Figs. 202 and 203 are shown similar successive stages in the operations of putting together a sheet metal cuspidor. The curling at *e*, however, has in this case been done in a lathe, because the taper of the cone (see, also, Fig. 201) was too great for curling dies to work properly. The operations at *f* and *h* consist of a sort of a combined curling and smashing, somewhat similar to that shown in Fig. 198. At *g* and *i* the action is true curling, done in an inward direction.

In Fig. 204 is shown a pair of dies for the inward curling of a plain cylindrical body, Fig. 205, into the condition shown in Fig. 206. Sometimes this process is practicable at both ends of the work at once by double curling dies, and is well adapted for napkin rings, &c. Such dies can, of course, be arranged for real wiring if desired.

In Fig. 207 is shown a pair of dies for putting together by the process of inside curling a body and a bottom, as shown in its successive stages in Figs. 208 and 209 respectively. The function of the spring driven plate *a* in the lower die is to support the bottom when first laid upon it, but it of course descends therewith as the curling proceeds.

In Fig. 210 is shown a pair of dies for the inward curling of the large end of conical work, as shown in Figs. 211 and 212 respectively. In this case the curling ring is of course a contracting one.

In Fig. 213 is shown a pair of dies for the inward curling of the small end of conical work, as shown in Figs. 214 and 215 respectively. In this case the curling ring *d* expands.

Principles of Curling.

In analyzing the principle of the curling process we will find that it cannot be practiced upon the edge of a flat sheet of metal, and that said metal must not lie in a plane but in the surface of a cylinder, or approximately so. It is therefore not practicable to curl or wire rectangular utensils or other articles having a prismatic or pyramidal rather than a cylindrical or conical form. It is true that a curling action might take place at the angles of such pyramids or prisms if they were somewhat rounded off to a curved contour, but at the sides, where the edge followed straight lines, it would simply be bent, as at the top of M, Fig. 216, instead of being truly curled.

In Figs. 216 to 221, inclusive, are shown at U in vertical axial section one side of a broken away curling ring, and at M, in Figs. 218 to 221, similar sections of a piece of plain cylindrical work near its upper end, these latter pictures showing various successive stages as the die U descends in the operation of true curling.

In Fig. 216 is shown the bending action before referred to where the edge of the work lies in a straight line. Or, for the sake of illustration, let us suppose that M is a little bar of metal, standing on end, and say $\frac{1}{64}$ inch thick by $\frac{1}{4}$ inch wide, shown in edge view. It is evident that when this straight vertical bar is struck by the inclined surface of U at the point *a* and below it will be bent outward, but with a long bend, as shown, instead of a short one, as in Fig. 218. This is by reason of the ordinary principles of leverage, which cause a bar to bend as far as possible from the end where the force is applied so as to obtain more leverage for such bending, its starting point being determined in this case by the outside resistance at *b*, which is supposed to be the confining part of the lower die. If the operation is carried a little further the top end of the bar reaches a point in the die at *c*, and there is a general smash, or perhaps it is carried down in some irregular and undesired form. If, however, when it first starts to bend outward it could be confined at the point *d* on its surface and after the extreme end is bent into a short curve it could be again confined at *e*, and still later at *f*, it is evident that it would assume the proper shape and approximately follow the semicircular curvature of the die at *a*, *c*. To illustrate more plainly: supposing that we have a vessel composed of a number of the small bars M, arranged in a circle like the staves of a barrel, and supposing that we have a hoop at *d* which will confine them all until a bend is started at each of their ends, and that then it will expand and another hoop at *e* will hold them until they are again bent, when this hoop in its turn expands—and so on. Such an arrangement would evidently develop a curling operation, and the action described is what really takes place, the metal itself being at the same time its own staves and its own hoops. To prove that a square can could not be properly curled along its flat sides, it is only necessary to imagine a square barrel in which, obviously, the hoops would have but an infinitely small resistance to the expansion of the staves, except at the corners.

With inside curling the holding in action at *d*, *e*, *f*, &c., is due to the compressive instead of the tensile resistance of the metal in a circumferential direction as before. Then by analogy we have the arch instead of the hoop principle, and our little staves become the arch stones.

When the edge of a piece of metal has once been set into a curve of small radius at the extreme edge, and when the forming of the incipient curl thus commenced is gradually continued, as in Figs. 219, 220, &c., there is no action tending to straighten it out again except (in the case of outside curling) the resistance of the edge of the metal to compression as it travels inward from *g* to *h*, Fig. 221. This resistance is not, however, as has been proven in practice, sufficient to spoil the curl, which consequently progresses inward until it strikes the main body of the metal; or, indeed, if the process be continued long enough, until it goes on around in a spiral form, as shown in Fig. 222. With internal curling the circumferential stresses in the edge of the metal as it travels from *g* to *h* are of course tensile instead of compressive, but again are not sufficient to balk the curling propensities existing.

It is evident that as the edge of the metal travels outward from *a* to *c* in external curling, it must be stretched or made longer circumferentially. This, in some cases, is sufficient to crack it in a radial direction at numerous points around it. To guard against this the diameter of the curl must not be too large in proportion to the diameter of the vessel operated upon. Its behavior in this respect depends also upon the thickness and toughness of the metal. If, again, the curl itself is too large in relation to the metal's thickness, the edge does not go in properly from *g* to *h*, as was predicted for it in the last paragraph, and sometimes with the large curling used with real wire it is necessary to roll the edge down afterward in some kind of a burring machine. Especially is this apt to be the case with external curling upon work with considerable taper, like dish pans. The large diameter of the pan, the largeness of the wire which is usually

put in, the greater distance to *h* on account of the taper, and the proportionate thinness of the metal all serve to present bad conditions for true curling.

With internal curling there is less trouble in regard to the points above mentioned, but as the edge of the metal is first compressed and becomes smaller in traveling from *a* to *c*, it must be expanded and stretched in completing its journey from *g* to *h*. If tough enough it will go all right; if not, otherwise.

In practical work it is found that with ordinary tin plate and sheet iron a curl of from $\frac{3}{32}$ to $\frac{3}{16}$ inch can be obtained, according to various conditions above indicated. For larger curls to be successfully made, much thicker metal might be required.

The pressure necessary for curling is usually small, it being quite possible to do work of this kind upon tin plate in an ordinary foot press to 1 foot or more in diameter. The ram speed in running curling dies is immaterial, there being no limitations in this respect as presses are ordinarily run. The kind of press used is also immaterial, except that it must have hight enough for the depth of the dies, which is usually much greater than for work of other kinds, plus the depth of the work itself, so that it may be inserted between them and then dropped into or on to the lower die. This is assuming the lower die to be fastened to the press bed in the ordinary way, and would, of course, involve a very long stroke to the ram. In practice, however, except for very shallow work, the lower die is usually mounted upon a sliding or swinging table, which is brought forward each time the work is to be removed and replaced. It is then pushed backward under the upper die, which need have but an ordinary stroke of from 1 to 2 inches, according to the character of the particular dies in question.

Horning or Side Seaming.

Somewhat germane to the subject of curling and wiring, inasmuch as it is used in preparing utensil bodies for that process, is the operation of horning or side seaming. This also is an assembling process where two or more pieces are fastened together by press work, and is analogous to some of the putting together operations described a few paragraphs back.

In Fig. 223 is shown a front view of a round horn, L, which is, of course, in reality a lower die, and of an upper die, or so called "force," U. These, as shown, are adapted for closing down a side seam upon a cylindrical or conical body with an outside projection, as in Fig. 227.

In Fig. 224 are shown a horn and force adapted for square work, rather than round. In this case the horn is grooved and the face of the force is flat, thus adapting it for an internally projecting seam like that in Fig. 226. Either form of seam can, of course, be made in either round or square work.

In Figs. 225 and 226 are shown the successive stages of an ordinary lock seam, the first showing it loosely hooked together, the hooks having been previously formed separately; and the second showing it after being struck and smashed down solidly together in the press. In Fig. 227 the same thing is shown, but with the seam projecting outwardly, as before mentioned

In Figs. 228, 229 and 230 are shown, more as a curiosity than anything else, three successive stages of a peculiar patented seam which the writer once designed a special press for, the ram being supplied with three different dies, which put themselves in position successively during three quick blows which the press gave before stopping. The horn also was provided with an automatically changing lower die. The work was placed in the machine without hooks, as in Fig. 228, the three successive blows putting it first into the shape 229, then into 230, and finally smashing it so that it looked pretty much the same as Fig. 226. This seam was a success mechanically, especially for thin metals, although somewhat wasteful. For some reason unknown to me the owners have never put it upon the market.

There are numerous other forms of special seams which do not appear to have come into practical use, and there are also some machines for making automatically the ordinary locked seam first described. These, however, it will hardly be worth while to describe here.

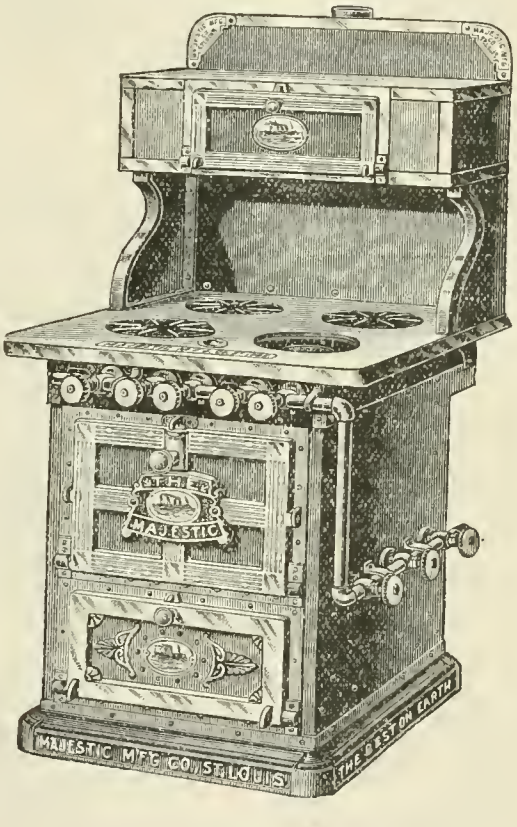
The speed used in seaming work is immaterial, although a quick hammer like blow would do the most good with a given press. The pressure required is considerable, and, within the limit of the metal's crushing strength, I should say the more the better. Again, we have no pressure measurements worthy of record.

The presses used for horning are usually special, with the projecting bed omitted from the frame, and in lieu thereof special means for inserting or otherwise fastening on horns of various sizes and shapes. For certain small work ordinary presses can be used, with horns mounted upon properly adapted bolsters.

Thomas Nevins & Son, contractors, of Orange, N. J., have contracted to purchase the entire street surface railway system of Detroit, Mich. The lines are 80 miles long, of which 30 are trolley lines. The purchasers intend to equip the system throughout with trolley lines as well as to extend it. This is one of the largest contracts in the history of electric roads.

Majestic Gas Range.

The Majestic Mfg. Company, St. Louis, Mo., have added to their already extensive assortment of gas burning appliances a new line of ranges known under the name "Majestic." These goods are made with body and oven of cold rolled steel, the oven doors, frames, hinges, stakes and handles of malleable iron, while other portions are of the best gray iron. All parts of steel and malleable iron are firmly riveted together. The illustration which we present herewith shows one of the varieties in which this line is offered to the trade. The oven is 18 inches wide, 18 inches deep and 12½ inches high, the roasting and broiling oven being of the same width and depth, but 10 inches high. The top surface of the stove measures 24 x 28 inches, and is provided with three single burners and one double burner. The air mixers are provided with cut offs admitting more or less air, as may be required. The oven is heated by inverted twin burners, which are said to produce a flame nearly sky blue in color, thus economizing fuel and utilizing to the full extent the products of combustion. All the flues are lined with asbestos board. One form of range has an attachment in the shape of a 10 gallon copper reservoir, planished outside and tinned inside. There is also provided an improved shelf warming oven, which is heated by placing a hollow cone over one of the rear burners and thus conveying the heat to the under side of the oven.



Majestic Gas Range.

In some of the agricultural districts of Pennsylvania the demand for small farms is said to be greater than has been ever before known.

PLUMBING and GAS FITTING.

Texas Master Plumbers.

The fifth annual convention of the Texaa Master Plumbers' Aasociation was held May 9 at the Hutchins House, Houston, with a good attendance of delegates from the leading cities. The association was called to order at 1 o'clock. W. W. Otter, president of the local association, introduced Mayor John T. Browne, who in an appropriate address of welcome tendered the members of the association the hospitality of the city. President May in a befitting manner reaponded on behalf of the asaociation.

The Executive Committee was appointed a Committee on Credentials and reported the following cities repre aented: Austin—W. A. Burke, Teagarden & Co. Dallas—F. A. Campbell, D. F. Sullivan, S. C. Carroll, Ed. S. Davis. San Antonio—A. H. Shafer, Ed. Braden, Jr., Rudolph Strohmeyer. Corsicana—F. S. Brooks. Fort Worth—Geo. D. Ackley, J. F. Osborne, George Preuitt, J. B. Austin, Jas. Barry. Houston—W. W. Otter, R. B. Morris. Galveston—D. J. May, Paul Shean. Waco—J. S. Brazelton. Sherman—J. F. Madden, O. F. Johnson. Tyler—Thomas Henderson.

The officers elected for the ensuing year are: President, Ed. Braden, Jr., of San Antonio, vice-president; W. A. Burke of Austin; secretary, J. F. Osborne of Fort Worth; treasurer, A. H. Shaper of San Antonio.

Executive Committee—R. B. Morris, chairman, of Houston; D. J. May of Galveston and W. W. Otter of Houston.

Delegates to the National Convention—President, Ed. Braden, Jr., *ex officio*, of San Antonio; George D. Ackley of Fort Worth; A. H. Wainwright of Galveston; J. F. Madden of Sherman and Thomas Henderson of Tyler. The delegates go uninstructed.

A committee was appointed to revise the conatitution and by-laws and put them in such shape that they can be published in pamphlet form for the use of members of the association. This committee had a lengthy meeting and a general diacuasion over the proposed work.

The local aasociation gave a banquet at the Hutchins House in honor of the visitors.

Massachusetts Master Plumbers.

The annual meeting of the Massachusetts State Association of Master Plumbers was held at the Hamilton House, in Holyoke, last week. There were about 100 peraons preaent, including 64 regularly accredited delegates from local associations. The officers of the association met early in the forenoon, but the main body of the membera did not arrive until nearly noon. The seasion was devoted to the election of officers and a few technical details of work connected with the business represented, and a fine dinner. In the absence of the president of the association, Vice-President Jordan of Worcester presided and Daniel Shannon of Boston was clerk. Charles H. Tower of Holyoke was chosen sergeant at arms for the session. T. J. Carmody of Holyoke was chairman of the Committee on Credentials, and it was found that 64 were properly accredited. The report of the treasurer showed receipts of $218 and expenses of $119 in the year.

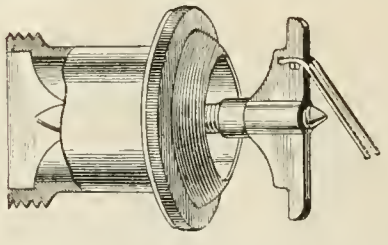
After the preliminary business adjournment was taken for dinner. The association went into executive session after dinner and discussed matters of interest only to the members. The committee appointed at a previous meeting to prepare a bill governing plumbing methods and secure its passage by the Legislature reported that the matter was progressing favorably. These officers were elected for the ensuing year by unanimous vote: President, W. H. Mitchell of Boston; vice-president, J. W. Green of Worcester; recording secretary, Daniel Shannon of Boston; financial secretary, C. P. Lyman of Holyoke; treasurer, E D. Casey of this city; Executive Committee, J. W. French of Boston, T. J. Gifford of New Bedford, R. E. Fogwell of Fall River, J. F. Davelin of Somerville and O. S. Kendall of Worcester.

T. J. Carmody and D. D. Casey were chosen delegates to the national convention, and C. P. Lyman and J. F. Kennelly alternates. The association will make an effort to organize the various associations throughout the State.

Votes of thanks were passed to the officers and the Holyoke association for the work that they had done in preparing for the meeting, which then adjourned.

Closet Repair Coupling.

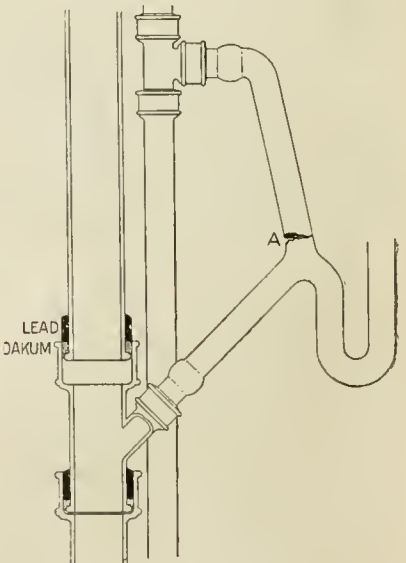
In a recent number of *The Metal Worker* appeared an illustrated description of a closet repair coupling introduced by Savill, Walla & Co. of 1229-1231 Budden Row, Philadelphia. The accompanying illustration shows another coupling put on the market by the same firm and designed for use where the old supply pipe and coupling are to be utilized, thus obviating the necessity for any change in the fitting of the closet. The coupling consists of a brass supply arm having a flange at one end over which fits a rubber washer with a raised tapered center. A T headed brass locking bar, screwed at its end, passes through the center of the arm and engages with a brass cross bar to which is attached a spring. The outer end of the arm is screwed with a 1¼-inch iron pipe thread, and its inner surface is recessed in order to provide a seat or stop for the head of the locking bar. In use, the cross bar is removed from the locking bar and inserted in the waterway or flushing rim of the closet; the supply arm is then placed in position and the locking bar passed through it and screwed by means of the T head into the cross bar until the recess or seat in the arm prevents further turning, when a tight and flexible joint will have been effected. The coupling may also be used on new or old closets where an economical and flexible coupling is required. The coupling is made in two styles, screwed for iron pipe, as in cut, and plain for lead pipe.



Closet Repair Coupling.

Defects Discovered by a Smoke Test.

The accompanying illustration shows a part of a plumbing system brought to our notice by Boyd & Schnaier, 347 Columbus avenue, New York, and found in a residence where they made a smoke test. The defects shown were in different parts of the building, but for convenience they are connected in the illustration. In each ample opportunity is afforded for the entrance of sewer air. The first defect and the one more likely to happen is due to the settling of the soil pipe. The lower section of the pipe had settled sufficiently to almost entirely draw away from the upper section, so that the lead which had been calked in the joint to make it tight was nearly drawn out, leaving nothing but the oakum to prevent the entrance of sewer gas. Under the test smoke freely came through this joint. The settling in the soil pipes below the fixtures is more probable than in the pipe above them, from the fact that the lower pipe has to support more or less of the weight of the upper pipe and resist the force of the water which is discharged into it. A



Defects Discovered by a Smoke Test.

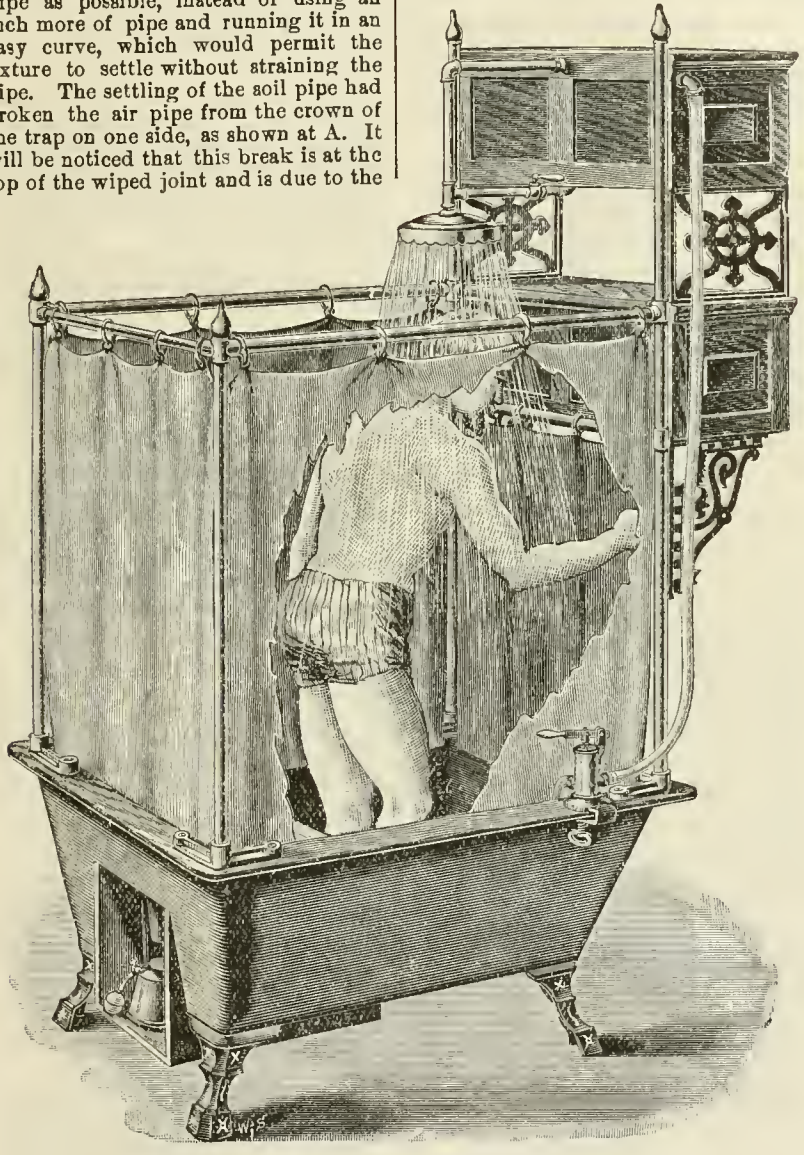
continuous downward blow is struck on the side of a pipe by the discharge of water from a water closet, which can be estimated at several pounds, and for a period of a minute or more, according to the size of the flush tank, from which some idea can be gained of what causes such pipes to settle. In buildings where the fixtures are used frequently the probability of the pipe settling becomes greater.

The other leak is shown at the crown of the trap under the lavatory and is due to two causes: In the first place the plumber in making a neat looking job, and to save pipe, runs the back air pipe as direct to the main ventilating pipe as possible, instead of using an inch more of pipe and running it in an easy curve, which would permit the fixture to settle without straining the pipe. The settling of the soil pipe had broken the air pipe from the crown of the trap on one side, as shown at A. It will be noticed that this break is at the top of the wiped joint and is due to the care of the plumber to do a neat job. In soiling this pipe and shaving it for the joint, in order to have a clean, well defined line around it, in all probability he used his dividers to mark the line around the pipe, and in doing so made a deep scratch in marking the pipe. This scoring made a weak point in the pipe. It has been clearly shown by experiment that an ordinary scratch on a piece of sheet lead will cause it to break along that line very regularly, while a piece of sheet lead that has no mark on it when pulled apart would require more force and would show a very irregular and ragged fracture.

The Smith & Anthony Company, 56 Beekman street, New York, in addition to their line of Sanitas plumbing appliances, are showing samples of the Oswego Indurated Fiber Company bathtubs and foot baths. In one of their windows a new attraction is an Italian marble lavatory fitted with bronze Sanitas trap, and bronze pipe with a patent Sanitas basin waste and red metal basin cocks.

Combination Bathtub.

We show in the accompanying illustration a combination bathtub made by the Ette & Henger Mfg. Company, St. Louis, Mo. The bath, it will be noticed, is self heating, and in addition, the manufacturers point out, will give, singly or in combination, any of the following baths: Hot water, cold water, hot air or steam, dry or wet vapor, alternating hot or cold, or plain, perfumed or medicated, spray, douche, syringe or bidet baths, and in addition has an adjustable stool with comfortable lazy back, which by a simple arrangement will automatically rub the back with either brush, sponge, towel or electrode. The heating is done either by a gas or gasoline heater adapted to heat from 12 to 18 gallons in from 15 to 20 minutes. The tubs are made of aluminum and polished inside and outside and with similar trimmings and hardwood finish to suit. The general baths are made of cast iron, painted with a special enamel to resist heat, and with trimmings of brass, nickel plated, and hardwood finish in imitation of cherry. Water can be brought to the tubs by pipes or buckets, or can be pumped from cisterns, if not too far off, by the pump clamped on to the rim of the tub. The bath illustrated has a vapor curtain.



Combination Bathtub.

Pipes and Electricity.

Plumbers will be interested in the following conclusions given by Isaiah H. Farnham in an exhaustive paper on the destructive effect of electrical currents on subterranean metal pipes, which was read before the American Institute of Electrical Engineers:

1. All single trolley railways employing the rails as a portion of the circuit cause electrolytic action and consequent corrosion of pipes in their immediate vicinity, unless special provision is made to prevent it.

2. A fraction of a volt difference of potential between pipes and the damp earth surrounding them is sufficient to induce the action.

3. Bonding of rails, or providing a metallic return conductor equal in sectional area and conductivity to the outgoing wires, is insufficient to wholly prevent damage to pipes.

4. Insulating pipes sufficiently to prevent the trouble is impracticable.

5. Breaking the metallic continuity of pipes at sufficiently frequent intervals is impracticable.

6. It is advisable to connect the positive pole of the dynamo to the trolley lines.

7. A large conductor extending from the grounded side of the dynamo entirely through the danger territory and connected at every few hundred feet to such pipes as are in danger will usually insure their protection.

8. It is better to use a separate conductor for each set of pipes to be protected.

9. Connection only at the power station to water or gas pipes will not insure their safety.

10. Connection between the pipes and rail or rail return wires outside of the danger district should be carefully avoided.

11. Frequent voltage measurements between pipes and earth should be obtained, and such changes in return conductors made as the measurements indicate.

In closing this somewhat rambling paper, I can do no better than use words which will remind you of Patrick Henry—"eternal vigilance" will be the "price" of pipes and cables where conditions favorable to electrolysis exist.

TRAPS AND VENTS.

Garrett D. Voorhis died at his residence at Paterson, N. J., at the age of 64 years, last Monday. He had carried on a stove and plumbing business in that city for a number of years. He was a director in the First National Bank and the Paterson Savings Institution. He was also an active worker in the Young Men's Christian Association, having recently donated $1000 to its building fund. He is survived by a widow and a daughter.

The American Tube Works, Boston, Mass., are sending out a 34-page pamphlet devoted to their seamless drawn brass pipe for plumbing. It gives a list of sizes and weights and states that they are tested to a hydrostatic pressure of 1000 pounds per

square inch. This is followed by a brief description of the pipe, and the remaining 24 pages gives the names of prominent plumbers in different cities who have used the brass pipe and a number of public buildings and private residences in which it has been put.

A. A. Caswell and John Dickson have formed a copartnership and entered into the plumbing business with headquarters on North street near the junction of Essex, Salem, Mass.

Samuel A. Stevens, the veteran plumber, at Salem, Mass., has retired from business, and has been succeeded by Staten & Tyler.

George M. Ellis has purchased his partner's interest in the plumbing, steam and gas fitting business of Ellis & Hull, at 258 Franklin street, Norwich, Conn., and will continue the business himself.

At the last meeting of the Master Plumbers' Association, held at their meeting rooms, Builders' Exchange, 19 West Saratoga street, Baltimore, Md., the following officers were elected for the ensuing year: E. J. Healy, Jr., president; P. T. Barry, first vice-president; G. W. Addison, recording secretary; C. H. Frederick, financial secretary; D. N. Sullivan, treasurer. The following delegates were elected to represent the association at the thirteenth annual convention, to be held at Detroit, Mich., June 19 next: John Trainor. W. H. Rothrock, Geo. Knipp, H. C. Bowman, E. J. Healy, Jr., J. F. P. Carey, D. N. Sullivan, C. H. Frederick.

Chapter 419, section 114, of the Massachusetts laws of 1892 provides that "every school shall have at least one water closet or privy for every 20 persons therein attending. . . . Privies or cesspools shall not be allowed when a sewer makes water closets practicable." The citizens of Roslindale are remonstrating against the use of a school building which has but two water closets for 100 pupils.

Jarratt & Abel are a new firm at Macon, Ga., who will carry on a plumbing and tin business. The firm is composed of R. P. Jarratt, who established the business, and F. T. Abel, who has purchased an interest.

The Common Council of Pawtucket, R. I., have passed a new ordinance in reference to plumbing in that city.

N. Meredith has removed his plumbing shop from Church street to 5 South Perry street, Johnstown, N. Y.

The firm of Snoddy & Cook, plumbers, Hamilton, Conn., have dissolved.

James Chapman, a practical plumber, recently in the employ of John Downing, has engaged in business for himself with shop at E. E. Johnson & Son's stove store, South Laurel street, Bridgeton, N. J. He will do all kinds of plumbing and steam and gas fitting.

The Highgate Museum of Sanitary Appliances, in London, to which reference has several times been made, is being utilized in a very practical way for the benefit of plumbing and other students, classes of whom from trade and technical schools visit the museum from time to time and are there given lectures on sanitary subjects, illustrated by the object lessons at hand.

The Plumbers' Registration Bill which has been experiencing a troubled passage through the British House of Commons, owing to the opposition of the ironmongers, whose "side line" interest in plumbing was threatened, is now awaiting the second reading in the House, with a good chance of passing into law. The promoters of the measure have inserted a clause giving registration without examination to ironmongers now engaged in the plumbing business, and the block placed in its way by the influence of that trade has been withdrawn. The bill has still some other obstacles to contend with, however, and unless these are removed it may not pass in the present session of Parliament. The Braziers and Sheet Metal Workers' Union object to some features of the bill, and these objections are now under consideration by the promoters.

"We use nothing but absolutely pure lead in the manufacture of our lead pipe, and pure lead and pure tin in the solder that we sell," is the claim of the National Lead Works of 287 Pearl street, New York.

Denny Brothers, 36 Park place, New York, are issuing a 20-page catalogue of Denny's Imperial gas machine. The book is profusely illustrated with cuts showing the method of applying their machine for manufacturing gas to residences and buildings in localities where there are no large gas works. A full detailed description is given of the operation and working of the machine and the method of setting it up for use. It is stated that their gas may be used equally well as coal gas for mechanical and heating purposes. A cut is shown of their Imperial gas burner, designed for use in connection with gas machines. The book also shows the Dunning steam and hot water boiler for house heating, for which they are the New York agents.

A meeting of the Executive Committee of the Illinois Master Plumbers' Association will be held Monday, May 21, at 10 a.m., in the rooms of the Chicago Master Plumbers' Association, 197 Madison street, to arrange for a convention of the master plumbers of Illinois to consider means of increasing the membership of the State Association. Invitations to attend have been extended to the executive committees and presidents of local associations throughout the State.

The following delegates have been elected to represent the Master Plumbers' Association of Philadelphia, Pa., in the national convention of plumbers, to be held at Detroit, beginning June 19: William McCoach, William H. Doyle, George F. Uber, Frank P. Brown, John E. Eyanson, William L. Owens, William Harkness and Samuel W. Barnes.

E. Raymond, one of the representatives of Henry Huber & Co., 81 Beekman street, New York, is well known to the plumbing trade in New York and vicinity. Having had several years' experience with a kit of tools, he is well qualified to present the merits of the plumbing goods manufactured by his house. On water closet construction he is well informed and thinks that the Americans are far in advance of all competitors in the design and finish of earthenware closets.

Patrick J. Hart and Daniel E. Shea have opened a plumber's shop at 10 Putnam street, Fitchburg, Mass., under the firm name of Hart & Shea.

The plumbing firm of Honan & Leddy, New Britain, Conn., are open for business.

Last Saturday evening Frank A. Wendell opened his new plumbing establishment in the Kinsman Block, Salem, Mass. A large number of visitors inspected an endless variety of articles used in the business. One of the most attractive portions of the exhibit is in the front window, being a complete bathroom, arranged according to the latest ideas. Hot water heating apparatus is set up and shown as in use, with radiators, &c. An elegant line of gas and electric chandeliers with handsome lamps is also exhibited, with globes of all kinds, faucets and kindred articles. A complete outfit for a dwelling house, as far as plumbing is concerned, is in operation. Mr. Wendell has an office in the front of the store, with speaking tube connections with the work rooms, which are located in the rear and in the spacious basement.

The Hartford Association of Master Plumbers has elected the following officers for the ensuing year: President, George Mahl; vice-presidents, Edward Mahl, Thomas Oakes; recording secretary, J. J. Lawler; corresponding secretary, George S. Bull; treasurer, E. Lawler; financial secretary, W. B. Hogan; sergeant at arms, Charles Murray.

Alex. Murray has opened a plumbing and gas fitting store in Newburg, N. Y.

Chicago Delegates.

The Chicago Master Plumbers' Association, at their regular meeting on the evening of the 14th inst., elected the following delegates to attend the annual convention of the Master Plumbers' Association of the United States, which will be held next month in Detroit:

Delegates.	*Alternates.*
C. J. Herbert.	D. M. Quay.
P. Sanders.	R. B. Finn.
T. P. Culloton.	Thos Conlin.
G. A. Larson.	John Sanders.
Thos. Conway.	Chas. Byrne.
Chas C. Breyer.	J. H. Killian.
D. J. Rock.	David Whitford.
P. M. Murphy.	A. F. Irons.
A. C. Hickey.	Jno. Gannon.
John G. Roland.	P. J. Morrisey.
Jos. B. Breen.	T. C. Boyd.
M. L. Mandable.	J. H. Beam.
E. Baggot.	J. A. Voltz.
Jas. H. DeViney.	J. C. Cederholm.
Jas. H. Roche.	J. Nelson.
W. H. Cummins.	M. J. Carboy.
A. W. Murray.	
Jacob G. Weber.	
J. J. Doyle.	
B. H. Lear.	
J. P. Neurberg.	
C. J. Boyd.	

Additional Chicago delegates by virtue of their office are the following: Andrew Young and Robert Griffith, ex-presidents of the National Association; J. J. Wade, member of the national Executive Committee; W. T. Geary, State vice-president; Paul Redieske, president Chicago Master Plumbers' Association.

Clement A. Griscom, president of the American Steamship Line, describes the prospects for transatlantic cabin passenger traffic this year as being favorable for a better business than last year, although any large increase is not expected. The prospects for steerage business he thinks are not so satisfactory.

The shareholders of the Panama Canal Company, at a recent meeting in Paris, appointed a committee to establish a new company for the purpose of completing the canal.

STEAM AND HOT WATER.

Master Fitters' Convention.

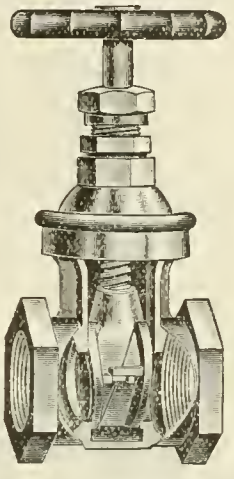
The following call for the sixth annual convention of the Master Steam and Hot Water Fitters' Association of the United States will be mailed generally to steam fitters and manufacturers about June 1. The call is signed by the Executive Committee, consisting of J. L. Wells, James Curran, Andrew Mercer, E D. Smith and J. D. Clarke; also by President E. Rutzler and Secretary Geo. H. Reynolds, whose address is the Broadway Central Hotel, New York:

The sixth annual convention of the Master Steam and Hot Water Fitters' Association of the United States will be held at the Broadway Central Hotel, New York City, commencing Tuesday, June 19, 1894, at 10 o'clock, a.m. A cordial invitation is extended to all master fitters to attend this meeting, whether members or not. We urge each and every one who receives this communication to make inquiry of others of the craft and to advise any whom this has failed to reach that they are included in the invitation. Reading of papers by members has been an attractive and successful feature of our last two conventions. By referring to the various trade journals you will see our announcement giving subjects and authors of articles promised for this annual meeting. New York City with its diversified interests is attractive at any season of the year. On June 15 the numerous summer resorts in and about the city will be open to the public and can, after final adjournment, be visited by those who desire to do so. The Broadway Central Hotel is located on Broadway, between Bleecker and Third streets, and is in its appointments well adapted for holding conventions. The accommodations are first-class and ample. For rates see return postal card, which please fill out and mail. Railroads have granted full rates going and one-third returning by same route. Secure your certificates when buying your tickets and have them properly indorsed at the meeting. Local ticket agents will be instructed and can give full information. The usual entertainment will be arranged for the ladies, which we hope they will be here in increased numbers to enjoy. Those desiring to make exhibits of their goods at the convention can get particulars by addressing the proprietors of the Broadway Central Hotel. Many have already secured space, which emphasizes the importance of the meeting.

THE HERENDEEN MFG. COMPANY, Geneva, N. Y., distribute circulars illustrating the Furman Junior hot water boiler. A general view is shown of the apparatus, together with interior and other views. The Furman Junior is adapted for supplying hot water for conservatories, small dwellings, baptisteries, poultry houses, stables, bathtubs, carving tables, laundries, &c. The water section is cast in one piece and no brick work is required.

Diamond E Gate Valve.

The gate valve shown in the accompanying cut is placed on the market by Ette & Henger Mfg. Company, St. Louis, Mo. In construction, the principle of the body and disk is of the usual order, but having a diamond shaped wedge, tapered and higher in



Diamond E Gate Valve.

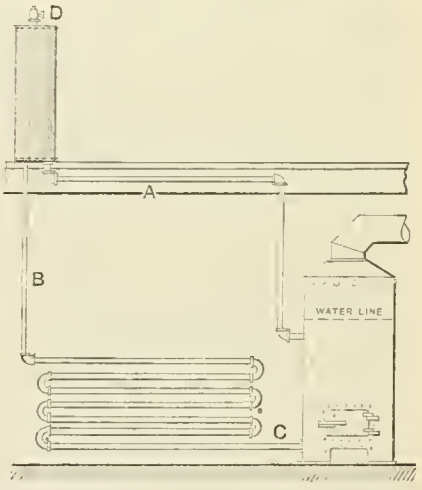
the center than at the ends to insure a perfect seat and to overcome grinding. It is stated that each valve is tested to 300 pounds pressure and guaranteed to be perfect in all respects. These are made in regular sizes from ½ inch to 6 inches.

The Raymond & Campbell Mfg. Company

of Middletown, Pa., have just issued a 102-page catalogue descriptive of the Lindemuth Sun steam and hot water heaters. The catalogue is oblong in shape, and appears in buff paper covers, the front page bearing a lithographed title, with a cut of the boiler on an outstretched hand, and the motto: "The Pride of the World." The first inside page bears the company's card with a list of their agencies and a view of their works, the latter contained within a scroll of handsome design. The second page is taken up with an announcement declaring that the aim of the company is to build and place on the market a superior article embodying the features most desirable in a heating boiler. The catalogue proper leads off with a description of the advantages of the Sun and the details of its construction, and there are shown illustrations of the base and fire box, drop tubes and top; other cuts show the position of the fire tubes as located in the water and steam space, and the method of placing and the position of the fire tubes and drop tubes. The Sun steam boiler is described at length and fully illustrated, and the qualities of the Sun as a heavy duty or closed tank system hot water circulator ably enumerated. The Lindemuth Sun steel sectional steam and hot water boiler is also shown, and the difference between its construction and that of the regular boiler explained. Page 16 shows the adaptability of the Sun as a brick set heater, and two diagrams are furnished in demonstration of same. About 20 pages are devoted to price-lists of the boilers, heating supplies, a telegraph and cable code, and directions for the proper attachment and use of the thermometer recommended for service with the boilers. The remainder of the book is taken up with *fac-simile* testimonials received from users of the boilers, and upward of 80 photographic reproductions of the houses and buildings to which the testimonials refer.

Hot Water Heating From Steam Boiler.

From REX, *Rochester, N. Y.*—The heating of hot water radiators from a steam boiler may be a novelty to some



Hot Water Heating from Steam Boiler. —Fig. 1.—Radiator Below Water Line.

of the readers of *The Metal Worker*, but it is sometimes done. It is a practice to which there are objections, however

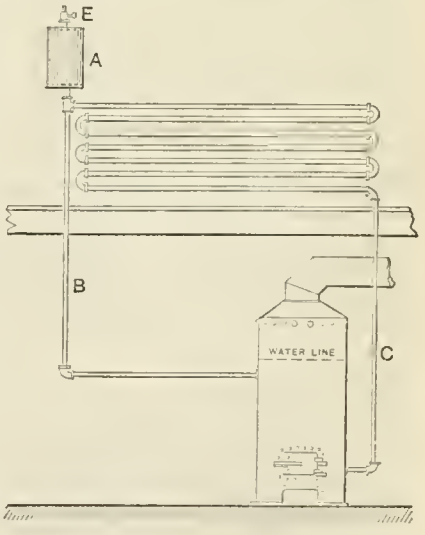


Fig. 2.—Radiator Above Water Line.

and should only be used to meet special requirements. Fig. 1 shows a radiator placed below the water line in the boiler. Fig. 2 shows a radiator above the wate

line in the boiler and when so placed the piping must be perfectly air tight. The air must be exhausted from the air chamber in both systems. One of the objections to this kind of heating is the difficulty experienced in keeping the system air tight. If not kept air tight there will be no circulation except when the steam pressure is sufficient to raise the water into the air chamber. In Fig. 1, A shows the flow pipe to the air chamber, D is an air cock and B showa the pipe from the chamber to the radiator and C shows the return to the boiler. In Fig. 2, B is the flow pipe, A is the air chamber, E is an air cock and C is the return pipe from the radiator. The heating of the water for the radiator will detract from the capacity or rating of the boiler about the same as though the radiator was heated by steam under the same conditions.

Note.—As an unusual practice the method shown will be interesting to many of our readers. There are doubtless other methods of doing the same thing and we hope those who have such systems at work will send us sketches and description.

HEATING NOTES.

The Standard Radiator Company, Buffalo, N. Y., issue some neat and tasteful circulars relating to the goods of their manufacture. One is given up to the Standard indirect radiator for steam or hot water. A half-tone engraving shows the appearance of the radiator and a few descriptive particulars accompany the cut. The three other circulars of which we have received copies relate to the New Standard radiator for steam or hot water and the Standard radiator for steam or hot water. The new Standard is likewise illustrated on a special heavy card which presents a half-tone engraving of the radiator and the name and address of the company.

The Smith & Winchester Company, Boston, Mass., send out circulars to the trade announcing the decision in the competition respecting the name of their new heater. The name selected by the judges is Winchester, this name being suggested by 52 different persons among the competitors. The first one received was from Charles O'Grady, Marlboro, Mass., who is entitled to the heater which was offered as a prize. Nine hundred and forty-two replies from the trade suggesting names were received and 329 different names were the result. The Smith & Winchester Company send out a letter giving the decision of the judges and a list of the names to the trade. The new heater is constructed entirely of cast iron, the water connections being made by screw joints, being furnished with an anti-clinker dumping grate, and is an easily erected apparatus. The manufacturers will soon issue a catalogue containing a full description of the Winchester, with cuts, and they hope to be able to fill orders by about June 1.

William Campbell, formerly of the Detroit Heating & Lighting Company of Detroit, Mich., and latterly manager of the steam and hot water department of the house of Sherman S. Jewett & Co. of Buffalo, N. Y., has accepted the management of the steam and hot water department of the Carton Furnace Company, Utica, N. Y., and Chicago, Ill., and will assume his duties at once. Mr. Campbell has had an experience in this line of business for the past 32 years, both in this country and abroad.

C. F. Bachler of 49 North Seventh street, Philadelphia, general agent for the Monitor wrought steel coil boiler, is sending out a folder containing a list of buildings and places where Monitor boilers are in use. The list is 9 feet long, and is contained in a stiff paper case, on the outside of which appears Mr. Bachler's card, and on the inside sectional and other views of the boiler.

The Board of Trustees of the Soldiers' Home, at Roseburg, Ore., selected and specified a Royal hot water heater for heating the home, which, as stated in *The Metal Worker* April 28, will be installed by the Dugan Bros. Plumbing & Heating Company of Salem, Ore. This firm, we understand, handle the boilers of the American Boiler Company, and install them unless the specification calls for some other apparatus.

Henry A. Gouge of the Gouge Heating & Ventilating Company, 47 Beekman street, New York, has just returned from Washington, D. C., where he had been consulting with some experts on the ventilation of the Houses of Congress with a view to securing better ventilation.

The John Simmons Company, 106–110 Centre street, New York, are sending the following letter to the trade: "Having leased the building 7 and 9 Franklin street, in rear of above address, and greatly enlarged our stock of cast and malleable iron fittings, including all reducing sizes, both in black and galvanized, erected a large pipe warehouse at 381 South street, besides adding to our equipment of pipe cutting machines and increasing the facilities of our machine shop, we believe we have unequaled facilities and are now in a position to sell at the lowest possible prices, while at the same time we propose to keep up the standard of our goods, on which we have made our reputation. We carry in stock standard full weight pipe, extra heavy fittings, valves, &c., specially adapted for mills, factories, refineries, and such as are used in steam, water, gas, oil and electrical engineering. We carry a full line of steel pipe specially adapted for bending. We invite your correspondence, or would be pleased to have you call on us for prices."

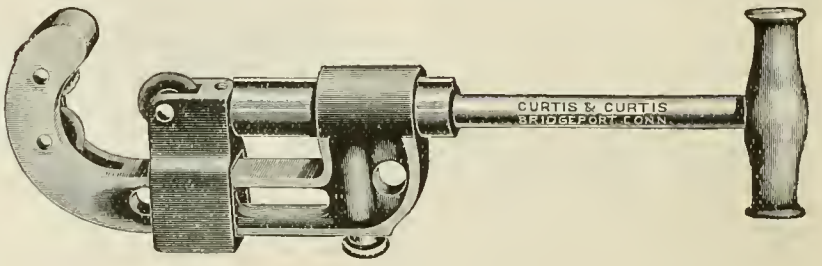
Morse Burtis, 52 John street, New York, manufacturer of valves, fittings, &c., has taken a suit of offices in the front of the building heretofore occupied by him, and on the same floor, giving much more commodious quarters.

A charter has been granted at the Pennsylvania State Department to the Sperl Heater Company of Carbondale, Pa.; capital, $20,000.

Robert Giffen, the eminent English statistician, has just issued a table comparing the trade of England, France, Germany and the United States in the period from 1890 to 1892. This table shows that the imports and exports have increased as follows: Imports—Germany and the United States, 33 per cent. each; England, 13 per cent., and France, 6 per cent. Exports—United States, 26 per cent.; France, 14 per cent.; England, 10 per cent., and Germany, 15 per cent.

Curtis Pipe Cutter.

Curtis & Curtis, Bridgeport, Conn., have placed on the market a new pipe cutter, a general view of which is shown in the accompanying illustration. A special feature of this tool is its simplicity, and several merits are claimed for this device by the manufacturers. The general principle is the same as in other three-wheel cutters, except that in this there is a very simple and quick adjustment which will save time to the operator. Instead of having the screw run through the body of the cutter it is run through a sleeve, which in turn slides in the body and is held by a spring pawl. Thus, in operating, the lengthy process of adjusting the cutters to the size of pipe to be cut is avoided by simply sliding the sleeve along until the wheel is against the pipe, when a few turns of the screw, while the cutter is revolved, cuts it off.



Curtis Pipe Cutter.

We learn from the Excelsior Steel Furnace Company, Chicago, Ill., that they have received advices from Washington that all their claims on their double seaming pipe machine have been allowed, and that patents will be issued on it.

The Philadelphia & Reading Railroad shops at Reading, Pa., have just turned out a monster steam whistle which, it is calculated, can be heard at a distance of 30 miles. The whistle is made of brass and is 3 feet long. It is intended for the power house at the Gordon Planes, Schuylkill County, Pa., its use being to obviate the necessity of the employees of the road traveling a long distance to ascertain whether the Planes will be put in operation at any time. The whistle will announce the hour for the men to report, the number of blasts indicating the hour.

One of the most lofty of the new down town "sky scraping" buildings in New York City is about to be put up at the corner of Nassau and Spruce streets, by the American Tract Society. The building will have 23 stories, and its total hight will reach about 300 feet. The cost is estimated at close on $1,000,000, and it is expected to be ready for occupancy by May 1, 1895. The hight of the new office buildings is only exceeded by the celerity with which they are run up.

TIN PLATES.

Condition of the Tin Plate Trade.

The tin plate trade is in a very singular condition. From the importers' standpoint it is exceedingly dull, with no immediate prospects of improvement. On the other hand, domestic manufacturers report an active demand for every pound they are able to produce, whether of bright or roofing plates. Both agree, however, in reporting prices stationary and with apparently no tendency to advance. Western jobbers are complaining of a restricted supply of roofing plates, which is giving them some inconvenience in meeting the demands of their customers. They are consequently applying to Eastern works that have heretofore done but little business in the West, to see whether shipments cannot be made more promptly. But they do not find much relief in that direction, as Eastern works are being driven as hard to meet the wants of their regular trade as the Western works. The situation is singular, inasmuch as importers are deriving so little benefit from an undoubted shortage in the supply.

The trouble is, of course, directly caused by the threatened tariff legislation, assisted to some extent by the depression in business of last fall and winter. Under ordinary circumstances, with no reduction in duty pending, contracts would have been made abroad in the fall months for tin plates to be delivered here during February, March and April, to meet the regular spring demand. But with a possibility of a heavy reduction in the duty, which last fall was expected to be made early this year, such orders for foreign plates were not placed. Merchants would not take the risk of a serious loss on the stocks they might have on hand in such an event. In the mean time, also, domestic tin plate factories had increased their facilities considerably, and merchants found that they could order small quantities as required by their trade, and avoid locking up capital in large stocks in their own warehouses. Even those who had been prejudiced against domestic tin plates were impelled by the business depression to turn to the domestic makers and take small lots in frequent shipments from the factories. Until very recently this worked well. The limited trade in progress was fairly supplied and there was no trouble. But now the consumption has greatly increased with the advance of the building season and the improvement in general business, and the domestic supply falls short of meeting the necessities of the trade. Imported stocks are not here to fall back on, but the danger of tariff reduction is more imminent now than it was six months since, so importers are more fearful than ever of incurring loss if they put themselves in shape to meet the rising demand.

Another feature has also developed which should receive consideration, as it is having an influence on the course of trade. The quality of American tin plates generally is so good that consumers prefer them, ask for them, and take imported plates with reluctance if they cannot get domestic. A short time since, before it was seen that there might be a shortage, a large Western jobbing house decided to handle only American plates, and its traveling men were instructed to run off the small stock of imported plates then on hand. They were told that the new stock would be American, and they surprised the house by the vigorous way in which they applied themselves to get rid of the foreign plates, because, as they said, their customers had for a long time so greatly preferred American plates that they had been handicapped in not being in a position to regularly offer them.

The domestic tin plate manufacturer is reaping the greatest benefit from the present situation among all concerned. Threatened with a severe cut in the duty which now protects his product, it might well be imagined that his natural condition would be one of suspense and indecision, planning meanwhile how to arrange his affairs so as to continue his business existence after the blow falls. But, curiously, he is probably kept too busy by the trade steadily coming his way to give very much thought to the future. He is making hay while the sun shines, and as the grass is growing very luxuriantly just now and the sun is shining on him very brightly, he can postpone indulgence in anxious care until the clouds are really overhead and the storm is beating down. Of all manufacturers the tin plate makers are probably the only ones who are actually deriving increased business by reason of the great delay in tariff legislation.

SCRAP.

We are officially advised that the report that the plant of the Ellwood Tin Plate Company, Ellwood City, Pa., had been closed down on account of lack of coal is untrue. The plant is still in operation, but, like nearly all other concerns, will probably close within a short time unless a settlement of the coal strike is obtained.

The American Tin Plate Machine & Mfg. Company, Linfield, Pa., have their plant in full operation, turning out 10 tons per day of finished plates. The concern have recently closed a contract for the sale of their entire output for some time to come. This firm are owners of the Buckman automatic continuous seaming and tinning machines.

An English exchange states that the plant for two additional tin mills has been shipped from Wales to be laid down at the Morewood & Co.'s tin plate works at Gas City, Ind.

The various tin plate works in Monmouthshire and Glamorganshire, owned by P. S. Phillips, the well-known Welsh tin plate manufacturer, are, it is announced, to be placed under the control of a limited liability company who have been registered with a capital of $1,000,000. The style of the company is P. S Phillips, Ltd., and it will acquire the well known Pontymister Steel and Tin Plate Works, near Newport, where the bitter strike raged for so long ; the Waterloo Tin Plate Works; the Abertillery Iron and Tin Plate Works; the Lion Tin Plate Works; Nantygle, &c. P. S. Phillips remains one of the directors of the new company, together with P. C. Phillips and F. A. Phillips.

The business of Hall & Carpenter, Philadelphia, carried on by the late J. Augustus R. Hall, has been purchased from the executors by Zachary T., Walter F., Harry B., and Willis E. Hall and Thomas B. Harper, who will continue the business at the old stand and under the old firm name of Hall & Carpenter. Their lines of tinsmiths' and stovemakers' supplies are well known to the trade. Their brands of roofing slates, including Hall's G. D. C., an old style plate, Killey, Seres and Argus, are also well known to consumers and are in active demand. Besides roofing plates they keep in stock some standard manufacturers' brands of bright plates, and are well able to satisfy the trade in this line. The members of the new firm are all good business men and competent to sustain the excellent reputation of the house.

Gummey, Spering & Co. of Philadelphia, the selling agents of the well-known Gilbertson's old method terne plates, will carry a much larger stock of these goods in future, their new quarters providing ample space for the purpose.

Black Diamond Tin Plate Works, Philadelphia, H. W. Scattergood, proprietor, are reported to be quite busy. Three trimming machines are in active operation, turning out both charcoal and coke bright tin plates and American roofing plates, for which a good demand has been met with. It is the intention of the proprietor to add more trimming pots as the exigencies of business demand. The brands of terne plates produced at the Black Diamond Works are Laurel, Arrow, Quaker City, Horse Shoe, and Black Diamond. The two last named are stamped, and the Black Diamond is referred to as an extra coated roofing plate of very superior quality. The bright plates produced bear the same brand names as the ternes. All are made of American rolled black sheets. The agents in New York City for the Black Diamond Works are Temple & Lockwood, 12 Platt street.

Geo. H. Ismon, sales agent for the Falcon Iron & Nail Company, Niles, Ohio, and the Salem Wire Nail Company, Salem, Ohio, has removed his office from Room 28, 277 Broadway, New York, to more commodious quarters in Room 32, on the second floor of the same building.

Sanderson & Peckham is the style of a new firm located at 76 Woodbridge street West, Detroit, Mich., who are rapidly coming to the front. They are styled manufacturers' agents, and sell to consumers and dealers a complete line of bright and terne plates, metals, tinners' and roofers' supplies, together with a few leading hardware specialties. Mr. Peckham is son of S. T. Peckham, late of the firm of J. S. & N. Peckham, Utica, N. Y. Mr. Sanderson was connected with the Black Hardware Company.

THE RETAIL STORE.

The Cream City Flour Bin and Sifter.

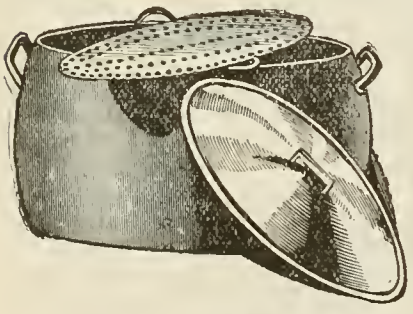
An illustration is herewith presented of the Cream City flour bin and sifter, made by the well-known manufacturers of tinware, the Geuder & Paeschke Mfg. Company of Milwaukee, Wis. The outer

The Cream City Flour Bin and Sifter.

wall of the bin is broken away in the cut, so as to afford a view of the working parts of thia admirable device for the convenience of the housewife. The manner in which it operates, as shown here, is so simple that no extended explanation is necessary.

Golden Crown Asparagus and Corn Cooker.

The cooker illustrated herewith is being offered by the Stuart & Peterson



Golden Crown Asparagus and Corn Cooker.

Company, Burlington, N. J. The cooker is an addition to their line of Golden Crown ware, and is provided with side handles. The strainer is removable and is designed for taking the vegetables from the pot. The point is made that the strainer is especially adapted to asparagus, as it keeps the bunches in order, which adds to their appearance on the table. It may also be used for meats and other purposes. The cooker is made in three sizes: Nos. 1, 2 and 3.

Squegee and Scrubber.

The Cleveland Novelty Company, Cleveland, Ohio, are offering the squegee and scrubber, of which illustrations

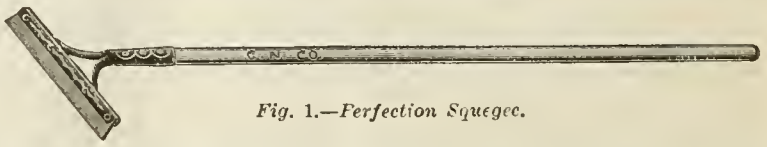


Fig. 1.—Perfection Squegee.

are here shown. The Perfection squegee, Fig. 1, has interchangeable parts, with malleable shank and decorated steel side stripa. It is remarked that

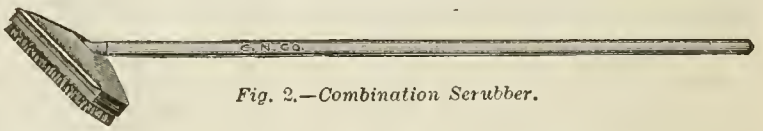
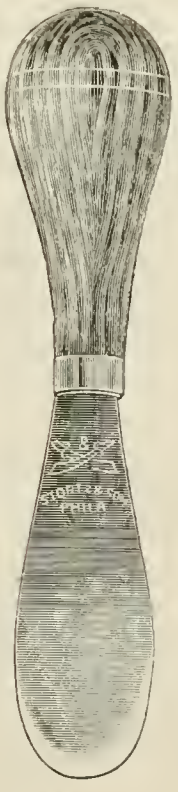


Fig. 2.—Combination Scrubber.

the rubbers are made of the best Para rubber, ¼ inch thick ; that when worn out new rubbers can be easily inserted, and that the device is thoroughly high grade. The Combination scrubber, Fig. 2, is a squegee and scrubber combined, composed, it is stated, of a Para rubber scraper, $\frac{3}{16}$ inch thick, and rice root brush of the best quality. It is adapted to the use of grocers, butchers and stores of all kinds.

The Philadelphia Ice Chisel.

The cut herewith represents an ice chisel being introduced by John Stortz



The Philadelphia Ice Chisel.

& Son, Philadelphia. The blade is 5⅓ inches long and 1⅛ inches wide at the broadest part. It is described as being forged from a superior quality of tool steel, carefully tempered and finished. The handle is of hardwood, nicely polished, and the tang of the blade is riveted through it. In shape the blade is similar to that of an iceman's axe, and is designed to crack ice in a straight direction without splintering. It is claimed that continued cutting in the same place will split the ice without splintering or chipping.

Central Draft Street Lamps.

The Rochester Lamp Company, 42 Park place, New York, well-known makers of the Rochester lamps and

Central Draft Street Lamps.

burners, have brought out a central draft street lamp, a general view of which is shown in the accompanying illustration. The advantages of the central draft lamp are being widely recognized, and its adaptation to street illumination will be of interest to the

trade. Special reference is made to the great amount of light the lamp gives. It is unaffected by wind storms, as the air entering the lamp passes through wire gauze and then down through the side tubes, one of which supplies the central draft through a gauze chamber and the other tube supplying the outside of the flame through another gauze chamber. The air currents are so modified by this means that the lamp has been successfully used on ferry boats. The globe is held up by a hook while trimming or lighting. The regular No. 3 or 9 street lamp globe is used with it, and is so annealed and protected from heat by the use of a chimney on the lamp inside that it is proof against storm, rain, snow, sleet or hail. It is adapted to burn all night or the time of burning can be regulated. It is made with either bail or post socket, and with 26-inch enamel reflector, if wanted for railroad or other uses. For general purposes of railroad stations, hotels and stable lamps, we understand it is meeting with a large demand.

HEATING and PLUMBING.

NEW WORK AND CONTRACTS.

THE KEWANEE BOILER COMPANY of Kewanee, Ill., and 96 Lake street, Chicago, are building a boiler plant for use on the Chicago drainage canal. The plant will consist of three boilers 60 inches by 16 feet, fronts, castings, trimmings, breeching and smoke stack. This company report business as improving.

CLARKSON, SCOTT & Co., Drexel Building, Fifth and Chestnut streets, Philadelphia, Pa., have the contract for a steam heating plant for the Lorain apartment house, at Broad and Fairmount avenue. George F. Huber & Bro., 738 North Thirteenth street, have the contract for the plumbing work.

THOMAS WEATHERED'S SONS, 244 Canal street, New York, will use one of their No. 6 hot water heaters for heating the residence of E. T. Bedford, at 121 Clinton avenue, Brooklyn, N. Y.

ALBERT CRYER & Co., 85 Centre street, New York, will install a heating plant in the new parochial school at Seventy-sixth street and Lexington avenue, using the largest size Richmond Sectional boiler and 3300 feet of Bundy Columbian radiation. They are installing a Victor hot water plant in the residence of J. Montgomery, Seventy-fourth street and Riverside drive. They have recently completed the installation of a Victor brick set steam heater in the Kill von Kull Club of Staten Island, N. Y.

RUBEL & Co, 75 and 77 Lake street, Chicago, are to install hot water heating plants in the residences of A. Florsheim and C. Cline, located on Vincennes avenue, near Forty-third street.

THE BUILDING COMMITTEE of the Board of Education of Saratoga Springs, N. Y., have been instructed to receive plans and bids for various systems of heating and ventilating an annex to their High School building.

THE BUILDING committee of the Odd Fellows' Temple recently held a special meeting at 110 State street, Albany, N. Y., to pass upon bids for plumbing and painting and to confirm other contracts. The plumbing work upon the building will be executed by Ridgway & Russ.

THE EXETER MACHINE WORKS, Boston, Mass., have received an order for Exeter radiators to be shipped to Copenhagen, Denmark. We underatand that the export business of this concern is rapidly increasing.

THE BOARD OF ALDERMEN of Buffalo, N. Y., have passed a resolution adopting the blower system of heating and ventilation for the new school house to be erected on Gurnsey street, for which plans are being prepared.

THE DUDLEY HOTEL, at Salamanca, N. Y., is to be rebuilt and enlarged, and among the improvements will be a steam heating plant and a plumbing system.

HART & CROUSE, 211 Water street, New York City, report, through their manager, W. M. Mackay, the following recent sales of Royal steam and water heaters: Wood Bros., Fishkill, N. Y.; F. Samuelson, Arlington, N. J.; Henry Dickson, Newark, N. J.; W. H. Clark, Lebanon, Pa.; Daniel McGurl, Pottsville, Pa., two heaters; German Methodist Parsonage, Dutch Kills, Long Island City, L. I.; Bogle & Scott, corner Hudson and North Moore streets, New York City; Virginia Plumbing & Heating Company, Roanoke, Va.; Dr. W. B. Johnson, Paterson, N. J.; A. L. Thrall, Jamestown, N. Y.; Paul Gantert, Palisade Park, N. J.; Geo. Devilin, Ravenswood, Long Island City, L. I.; Rudolph Guggenheimer, 101st street and Madison avenue, New York City, two heaters; J. Montgomery, West Seventy-fourth street, New York City. They report business on the increase.

LEE BROTHERS were awarded the contract for the plumbing in the fire engine house at Glens Falls, N. Y.

BIDS will be received by the Board of Education of Detroit, Mich., up to May 22 for heating and ventilating an addition to the Van Dyke School by means of hot air furnaces.

A. A. SANBORN has been awarded a contract for heating and ventilating the new High School building at Somerville, Mass.

THE UNION FURNACE COMPANY, 65 Dearborn avenue, Chicago, are to install a steam heating plant in the 24 flat building of T. E. Dorne & Co., Sixty-second street and I. C. R. R. tracks. Also in the residence of R. M. Wells, 3804 Michigan avenue.

THE CONTRACT for heating the north side of the Disston School, Thirty-fifth Section, at Philadelphia, has been awarded to Davis & Gorman Company for $1362.

THE SUPERVISING ARCHITECT of the Treasury Department has awarded Crook, Horner & Co. the contract for furnishing and erecting the plumbing apparatus for the Post Office building at Vicksburg, Miss.

PROPOSALS will be received by the Board of Education of Cleveland, Ohio, up to June 5, for a new school house which will require a system of heating and ventilation, will be lighted by gas and have a plumbing system.

SHEAHAN & GROARK, New Haven, Conn., the steam fitters and plumbers, are fitting up the house of Judge Samuel Bronson, on Dwight street.

THE CONTRACT for the heating apparatus for the new hospital at Easton, Pa., has been awarded to the H. B. Smith Company of Philadelphia, who will put in a hot water plant.

THE CONTRACT for the heating apparatus for the new gymnasium at Springfield, Mass., has been awarded to the Phillips Mfg. Company, whose bid was $956.

BABB, WITHAM & KELLEY, plumbers, Bangor, Maine, are doing a brisk business this spring. They have just put a very complete system of steam piping into St. Mary's Parochial School.

THE SMITH & ANTHONY STOVE COMPANY, 217 Lake street, Chicago, are to place their new Hub steel plate furnaces in six residences and two flat buildings at Ravenswood, and in four residences at Oak Park.

H. A. R DIETRICH, Bethlehem, Pa., has received the contract for placing a steam heating plant in the extensive addition to the residence of R. P. Linderman on Fountain Hill.

AT A RECENT MEETING of the School Board Building Committee of St. Louis, Mo., John Kelley, assistant superintendent of repairs, presented recommendations for appropriations of $8904.89 for repairs and $23,311 for putting steam heat in the school buildings instead of stoves and furnaces.

Southern Pig Iron Freights.—The Queen & Crescent Route has issued a new east bound pig iron tariff, effective May 15, giving rates on pig iron in carload lots from Southern furnaces to the following plants:

To	From Dayton and Rockwood, Tenn.	Chattanooga, Tenn.	Rising Fawn, Ga., and Fort Payne, Ala.	Birmingham district.
Wilmington, Del ..	$3.70	$3.70	$3.95	$4.20
a Baltimore, Md. (rail and water).....	3.54	...	3.50	3.50
Baltimore (all rail)..	3.50	3.50	3.75	4.00
Washington, D. C...	3.51	3.51	3.76	3.76
a Boston (rail and water).	3.89	.....	3.85	3.85
Boston (rail and water) via Providence	4.54	.....	4.50	4.50
Elizabethport, N. J..	4.10	4.10	4.35	4.60
**a* Jersey City (rail and water).....	3.54	.. ..	3.50	3.50
Jersey City (all rail).	4.10	4.10	4.35	4.60
Lockport, N. Y... .	3.30	3.30	3.55	3.80
†*a* New York (rail and water).	3.54	.....	3.50	3.50
Allentown, Pa.....	3.70	3.70	3.95	4.20
Chester, Pa.....	3 90	3.90	4.15	4.40
Harrisburg, Pa . ..	3.56	.....	3.81	3.81
Lancaster, Pa.....	.. ...	. ....	.....	.....
a Philadelphia (rail and water).....	3 54	. ..	3.50	3.50
Philadelphia (all rail)	3.70	3.70	3 95	4.20
Pottsville, Pa..... ..	3.70	3.70	3.95	4.20
Reading, Pa.....	4.27	.....	4.52	4.52
Scranton, Pa.....	3.70	3.70	3 95	4.20
a Providence, R. I. (rail and water)...	3.89	. ...	3.85	3.85

a Via Norfolk.
* In addition to above charges the cost is as follows: In lots of 50 tons and less, 60 cents per ton; over 50 tons, 50 cents per ton.
† The above rates cover pier delivery only. Additional charge within lighterage limits is as follows: In lots of 50 tons and less, 60 cents per ton; over 50 tons, 50 cents per ton.

A gushing oil well was struck on the 11th inst. in the new oil field near Neodesha, Kan. The well is 850 feet deep. For some time after the vein was tapped the oil was thrown above the top of a 74-foot derrick.

On her eastward voyage last week the swift Cunarder "Lucania" broke the record for a single day's run by covering 524 knots, on May 9.

Brooklyn gas companies have reduced their rates to $1 per 1000 feet.

ROOFING AND CORNICE.

John Galt & Sons.

John Galt & Sons, who have been at 52 John street, New York, for about 20 years, have established themselves in new and very desirable quarters in the Postal Telegraph Building, at Broadway and Murray street, rooms 805-806. This concern are said to be pioneers in the business of quarrying slate for roofing and other purposes and delivering it at a railroad station. This industry they commenced in 1861 and ever since their sales for domestic trade, we are told, have averaged 125,000 squares a year. From 1864 to 1875, inclusive, they claim to have supplied two-thirds of all the slates produced in this country. In 1876, owing to peculiar conditions abroad, they commenced exporting to Europe, largely to Great Britain, which is itself a large slate producing country, sending on an average 200,000 squares each year until 1879-80, when the bulk of the trade in that market lapsed. Up to 1893 they have done quite a large business with Australia, and more or less to date with the West Indies and South American countries. Slates in America are sold by squares, a square being equivalent to a space 10 feet square or 100 square feet. In England they are sold by the thousand pieces, but the buyer really gets 1200, while Welsh slates are furnished on the same basis with 5 per cent. in quantity added for breakage, or 1260 for 1000. The latter custom evidently has grown from the fact that slates quarried in Wales are thinner, with a consequent larger loss in handling.

Friedley & Voshart,

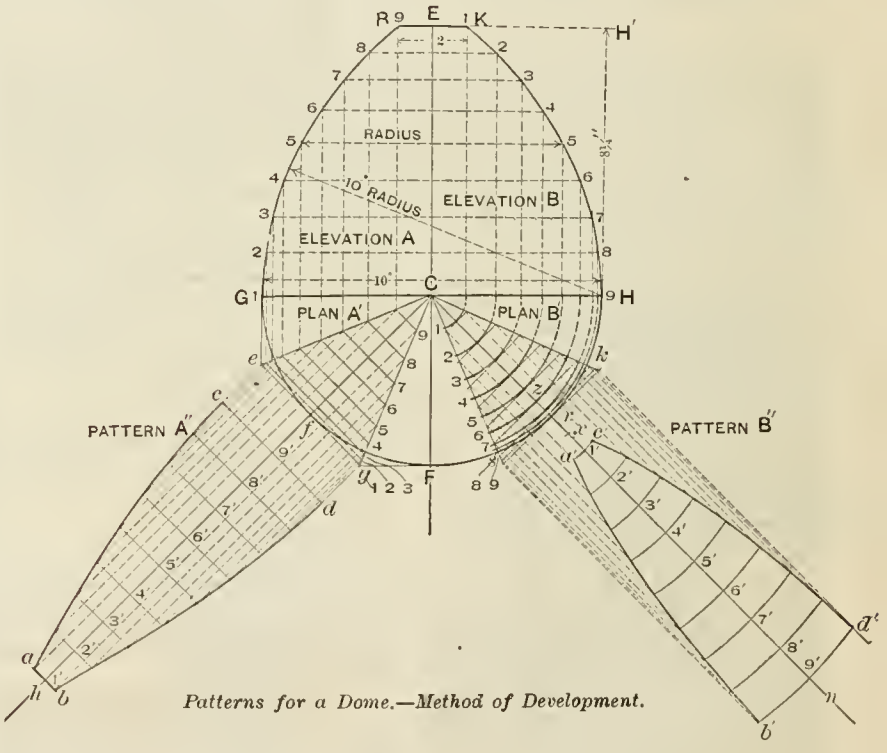
194 and 196 Mather street, Chicago, have just issued a new catalogue of architectural sheet metal ornaments, statuary, &c. This catalogue is their fifth annual, and is said to be the largest in its line which has thus far been published in this country. It comprises 136 broad pages replete with illustrations and price-lists. Many of the designs shown are entirely new, and are exclusively brought out by this firm. The first half dozen pages are used for the display of designs for statuary. These are made from models by some of the best artists and sculptors in the country. Next follow mediæval and modern forms of gargoyles and eaves trimmings, heads of animals, human heads and medallions, followed by festoons, garlands and wreaths in very great variety, rock faces in numerous patterns, panels, scrolls and square, oblong and circular rosettes, ceiling center pieces, finials or pinnacle tops, twisted tops, column trimmings and urns, shells, friezes, moldings and ornamental designs for enriching all kinds of finishing work, creatings, dormer window embellishments, gable ornaments, panel ornaments, capitals, leaves, mansard roofs, ceilings, points, crockets and volutes, conductor heads, spun balusters, merchants' emblematical signs, &c. The firm greatly enlarged their factory the past year so as to be able to meet orders for special or stock goods with the least possible delay.

Patterns for a Dome.

From J. C. A., *Green Bay, Wis.*—I would like to see a method, or methods, published in *The Metal Worker* by which I can obtain the patterns for a dome shaped article of eight pieces, and either octagon or round in plan. As shown in the accompanying sketch, the base of article G H is 10 inches, and the top R K 2 inches in diameter. The vertical hight H′ H is 8¼ inches. The profiles G R and K H have a radius of 10 inches, and are struck from points G and H as centers.

Answer.—In the accompanying diagram let G R K H be the elevation of dome, to be constructed of eight pieces, as indicated in plan by G *e g s k* H. In elevation A and plan A′ the pattern is obtained for an article having eight flat sides and octagon in plan, while in elevation B and plan B′ the pattern is obtained for an article of eight pieces, but round in plan, the pieces to be formed to the required shape by raising. To obtain the pattern A″ from elevation A and plan A′ proceed as follows: Draw the elevation in such a manner that one of the sides, as G R, will be shown in profile; also draw the corresponding plan in line, as shown by G *e g* F. Divide the profile G R into any convenient number of equal parts, as indicated by the small figures, and from the points thus obtained drop lines parallel with the center line E F, cutting the miter line C *e*, as shown by the dotted lines. From the points thus obtained in C *e* carry lines parallel with *e g* of plan, cutting C *g*. On C *f* extended, as *f h*, lay off a stretchout of R G, as shown by *f h*, through the points in which draw the usual measuring lines. Place the T-square parallel to the stretchout *f h*, and bringing it against the several points in the miter lines C *e* and C *g*, cut the corresponding measuring lines drawn through the stretchout line *f h*. Lines traced through the points thus obtained, as indicated by *a c d b*, will form the desired pattern.

Using the elevation B and the plan B′, the pattern B″ is obtained as follows: From the points obtained in G R carry lines parallel with G H, cutting K H, and from the points thus obtained drop lines parallel with E C, cutting C H, as shown. With C as center, and the points in C H as radii, strike arcs cutting C *k* and C *s*. From the points of intersection in C *r* erect perpendiculars cutting C *s* and C *k*. On C *r* extended, as *r n*, lay off a stretchout of K H, as shown. With radii equal to distance across elevations A and B, as indicated by the dotted lines drawn from points in G R to K H, strike arcs through the points in stretchout line *r n*. Thus the arc *b′ d′* of pattern is struck with G H as radius, from point *x* as center. Arc *a′ c′* of pattern is struck with R K as radius, from point *z* as center. Place the T-square parallel with the stretchout line *r n*, and, bring-



Patterns for a Dome.—Method of Development.

ing it successively against the points of intersection of the perpendiculars with miter lines C *s* and C *k*, cut corresponding measuring lines drawn through the stretchout line *r k*. Lines traced through these points of intersection, as shown by *a' c' d' b'*, will form the required pattern.

FLASHINGS.

ÆTNA STANDARD IRON & STEEL COMPANY, Bridgeport, Ohio, issue a very neat roofing catalogue. The volume, of the usual dimensions, is bound in dark colored paper with gilt title, and contains much information that is of interest to the roofing trade. The company make black, painted and galvanized roofing sheets, plain, corrugated and in other forms; also common, cold rolled, pickled and plain finished sheets and plates and common and patent leveled sheets. The catalogue opens with a view of the extensive works of the firm at Bridgeport. Following a prefatory note are tables of weights. The illustrated portion of the catalogue relates to corrugated sheets, crimped iron roofing and siding, beaded siding and ceiling, weather boarding, siding, &c. At the close of the pamphlet are a number of blank pages for memoranda. We learn from the Ætna-Standard Company that trade is at present active under the stimulus of short supplies, brought about by the curtailed production resulting from the coal and coke strike. The firm have part of their works in operation on natural gas, but a portion is closed down on account of a lack of fuel. They have, however, abundant stocks of galvanized iron and black sheets, also corrugated, from which they will be able to meet all ordinary demands from customers during the present season.

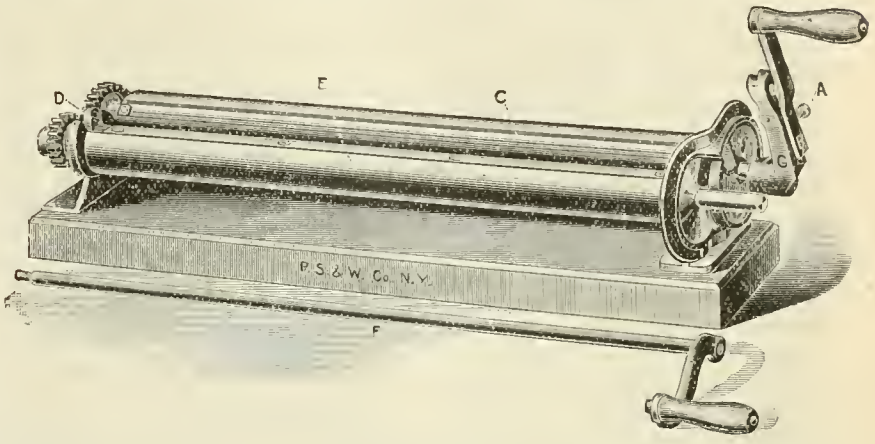
THE SALTSBURG ROLLING MILL COMPANY have been organized and are now at work on the erection of a plant at Saltsburg, Pa., on the line of the Baltimore & Ohio Railroad, some 8 miles from Pittsburgh, for the manufacture of fine sheet iron, sheet steel and rustless roofing sheets. The plant consists of three sheet mills and one sheet bar mill. The engine, bar mill and two of the sheet mills are being built by the Robinson-Rea Mfg. Company of Pittsburgh, builders of rolling mill machinery. The boilers are being furnished by the Carroll-Porter Boiler & Tank Company of Pittsburgh. The buildings will consist of a main building, 80 feet wide by 240 feet long, with shedding 30 feet wide and the same length, and boiler house, 32 x 60 feet. The buildings are of frame, with iron roof, and are about completed. The firm expect to be in the market with the above lines of manufacture about October next. The officials of the concern are S. A. Gourley, president; W. F. Stitt, treasurer, and Gill Sitt, secretary.

KNORR & BLOCKS 165 Wells street, Chicago, have contracts for furnishing the galvanized iron cornices, gutters, slate roofs, &c., for the store and flat buildings of C. J. Langan and Euhl & Smith, Lincoln and Southport avenues. Also for the residence of H. Zimmermann, Berdo and Perry avenues, Ravenswood.

ROBERT HOWARTH'S SONS of Chester, Pa., are putting a slag roof on the Chester Lumber & Coal Company's new shed at Chester. The area of the roof is 40,000 square feet, and over 100 tons of material will be used.

Eaves Trough and Conductor Pipe Former.

The Peck, Stow & Wilcox Company, Southington, Conn., and New York, are bringing out a novel and ingenious machine, as shown in Figs. 1 and 2, for forming both eaves trough gutter and conductor pipe. It is intended to take the place of the following regular machines heretofore used for this purpose —viz.: Gutter former, gutter beader, pipe former and folder. As shown in Fig. 1, the machine is arranged for turning a lock on and forming conductor pipe. Such pipe can be formed on this machine of any diameter from 2 to 4 inches, and when run through the machine in accordance with minute directions given with each the pipe is formed and a fold turned on the edge ready for grooving. Fig. 2 illustrates the machine as arranged for beading and forming eaves gutters. The machine described is 30 inches long, but can be made of any desired length within reasonable limits. The eaves gutters can be formed of any size, but the bead on the edge is made of only one size. This size, however, can be made to suit the requirements of the purchaser.



Eaves Trough and Conductor Pipe Former.—Fig. 1.—Arranged for Turning a Lock on and Forming Conductor Pipe.

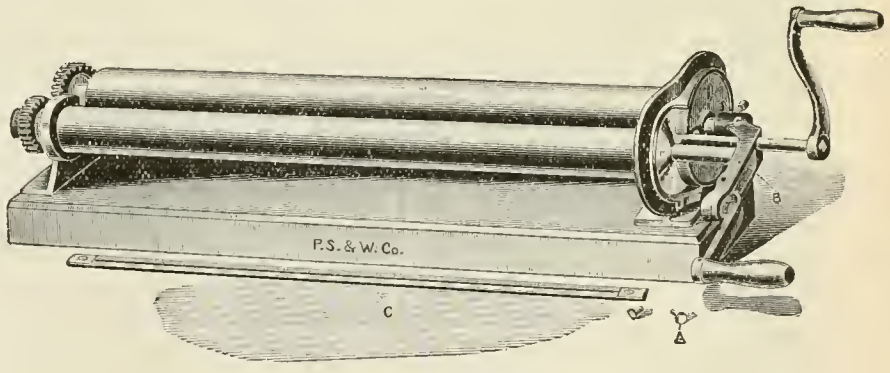


Fig. 2.—As Used for Beading and Forming Eaves Gutters.

Coin in the slot gas meters are to be tried in San Francisco. An English gas journal states that 75 of such meters have been shipped to that city from Glasgow, Scotland. They are adjusted to deliver 125 feet of gas for every 25-cent piece dropped in the slot.

Copperamiths in England have adopted a line of work that is meeting with great success. They are reproducing all the old fashioned shapes in jugs and vases in burnished copper. The old leather bottle shapes look very inviting in metal, and can be copied with surprising accuracy.

The insatiate maw of the Standard Oil Trust has just made another gobble. Under its Western name of the Continental Oil Company, it has absorbed the Vacuum Oil Company of Denver, Col., who control the sale of two-thirds of the lubricating oil consumed in the West.

A decision of importance was handed down last week by Justice Brewer of the United States Supreme Court, denying the right of certain Southern and Western States to levy the interstate commerce tax imposed on commercial travelers. A Chicago salesman recently visited Titusville, Pa., and, not having taken out a license, was fined $25. The judgment was affirmed, on appeal, by the Supreme Court of Pennsylvania. Justice Brewer in reversing this judgment said: "No State can levy a tax on interstate commerce in any form, whether by way of duties laid on the transportation of the subjects of that commerce or on the receipts derived from that transportation, or on the occupation or business of carrying it on." This decision will set at rest a long disputed question, and will be hailed with approval by the traveling fraternity.

Railroads in the West and Southwest are beginning to report increased earnings. This is regarded as a promising sign of recovery in those sections of the country where the late depression was most pronounced.

STOVE TRADE NOTES.

The New England Stove Trade.

The condition of things in this territory has not undergone much change since last reported. There is possibly a slight improvement in the demand for ranges, but it is scarcely enough to be worth noting. Notwithstanding this, the trade seems to be in a cheerful frame of mind; manufacturers having reduced production to fit the demand, and dealers having placed their orders with reference to the depressed state of things. Many more stoves might be sold if the dealers were willing to extend credit, but with the aversge workingman on short time and reduced pay, owing his grocer and butcher and not gaining any on his indebtedness, dealers generally are refusing to sell to this class except for spot cash. Orders for single stoves are numerous, and generally accompanied by the request that shipment be made at once, as the stove is already sold. Manufacturers in this vicinity are for the most part running on full time, particularly those in the Taunton district. Stocks of both jobbers and retailers are very low, and any revival in business will be felt almost immediately by the manufacturers, and some of them are discounting this by making up considerable stock. Medium and high price goods seem to be the best sellers at present, possibly the latter taking the lead. Collections are satisfactory.

An interesting feature of the New England stove trade is the business of two foundries, one in Massachusetts and the other in Maine, which sell their product entirely through peddlers. This system has been in vogue for some years and is carried on successfully. Carloads of stoves are shipped to various points and there met by two men with a team upon which is loaded as large a variety as the wagon will carry and then taken about the country from house to house and sold to the poorer class of farmers and laborers living in out of the way places, although occasionally these people invade the larger towns and temporarily create consternation among the regular dealers. The Yankee genius for bargaining finds great scope in this line, old stoves being frequently taken in trade and sometimes articles of farm produce, although for the most part the goods are sold outright and a long time note without interest accepted in payment. It is a common thing for these notes to run one year.

The furnace trade is halting. Local dealers have a good many estimates out, but as the building season is not fairly open few contracts have been awarded, consequently a hand to mouth business is being done in this line at present, but the prospects for the summer season are fairly encouraging. Gasoline stoves appear to be booming, and the sale of gas stoves is on the increase owing, it is thought, to the prevalence of $1 gas. Refrigerators are moving rather slowly, but some duplicate orders have already made their appearance.

Cupola Management.*—XII.

BY DR. EDWARD KIRK.

Relining and Repairing.

When a cupola is newly lined the lining is generally made of the same thickness from the bottom to the top except when the cupola is boshed. The casing is then either contracted to form the bosh or it is formed by putting in two or more courses of brick at this point. The lining varies in thickness from 4½ to 12 inches, according to the size of the cupola, the heavier linings always being put in large cupolas. The greatest wear on the lining is at the melting zone, where it burns away very rapidly. From this point up it burns away more gradually and evenly, but the greatest wear is toward the bottom, where the heat is the greatest, and so a cupola gradually assumes a funnel shape with the largest end down and terminating at the melting zone, and the lining is always thinnest at about this point when it has been in use for some time.

At and below the tuyeres the destruction of the lining by heat is very slight, and the principal wear is from chipping and jarring in making up the cupola. At the charging door the principal wear is from the stock striking the lining in charging. In the stack the lining becomes coated with sulphides and oxides and is but little affected by the heat. A stack lined with good material properly put in generally lasts the lifetime of the cupola. The length of time a cupola lining will last depends upon the amount of iron melted and the way in which it is taken care of, and varies from six months to three or four years when the cupola is in constant use.

A lining burns away very rapidly at the melting zone, and if not repaired every heat would burn out to the casing in a few heats. Above the melting zone it burns away more slowly and evenly, and gets thinnest just above the melting point. From this point it gradually grows thicker up toward the charging door, where the wear is comparatively slight. The thickness of lining required to protect the casing where the heat is most intense depends upon the quality of the fire brick and how the lining is put in. A lining of good circular brick made to fit the casing, and laid up with a good, well mixed grout, remains perfectly solid in the cupola as long as it lasts, and may be burned down to 1½ inches in thickness, and even less, for several feet above the melting point. When the brick do not fit the casing and large cracks or holes have to be filled in with grout, and daubing or the lining is poorly laid up, it becomes shaky as it burns out and in danger of falling out, and it cannot be burned down so thin as when solid.

It is therefore cheaper in the long run to get brick to fit the casing and have the lining well put in. It will then only be necessary to reline when the lining gets very thin almost up to the charging door. The lining at the melting zone, where it burns away the fastest, is often taken out for 2 or 3 feet above the tuyeres and replaced with a new one when it is not necessary to reline all the way up. In repairing a lining in this way the same size brick are generally used as were used in lining. The lining has been burned or worn away above and below the point repaired and the new lining reduces the diameter of the cupola to the smallest at the very part where it should be the largest. The result is that the new lining is cut away faster than any other part, and after a few heats it is as bad as it was before the new section was put in.

A better way of repairing a lining at the melting zone is to put in a false lining over the old lining. This is done by putting on a layer of rather thin plastic daubing over the old lining and pressing a split fire brick into the daubing with the flat side against the lining. The brick are pressed into the daubing close together almost as soon as it is put on and all the joints are filled up and the surface made smooth. A lining may be put in a cupola in this manner all the way around and to any hight desired, or only thin places may be repaired, which is done without forming humps in the lining that interfere with the melting.

A split brick is an ordinary fire brick, only 1 inch thick in place of 2 inches, and is now made by all the leading fire brick manufacturers. I believe I was the first to repair a lining in this way, some 20 years ago. The split brick could not then be procured from the fire brick manufacturers, and they were made by splitting the regular sized brick with a sharp chisel after carefully nicking them all around. When the regular split brick cannot be procured they may be made in this way. Most of the new brick split very readily and true, but bats from old lining generally spall off and are difficult to split. A lining of split brick can be put in almost as rapidly as the cupola can be shaped with daubing alone. The diameter of the cupola is not reduced to the same extent as with a section of new lining put in in the regular way, and the best melting shape for the cupola is maintained with only a reduction in the diameter of from 3 to 4 inches. This lining, when put in with a good daubing well mixed, lasts as long as an equal thickness of lining put in in the regular way; and it can be put in at a great deal less expense for labor and material. It is, however, worthless if put in with a poor, non adhesive and unrefractory daubing.

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The bats from old linings make an excellent daubing or grouting material when ground fine and mixed with a little clay, but few foundries have a sufficent quantity to pay for constructing a mill to grind them in, and the only other use that can be made of them in the cupola is to split the best into spalls for pressing into a thick daubing when repairing a lining.

[THE END]

Cleaning Castings.*

BY A. C. MOTT.

Before beginning this subject I wish to say that there is no probability of my saying anything new, or anything that is not already known to most, if not all, of you; and that if this article causes any discussion that will bring out the best and cheapest method of cleaning castings, its object, I take it, will be accomplished.

Into this subject, like all others pertaining to cleanliness, personality enters to the greatest extent. Some persons are noticeably clean; others the reverse. Some persons have everything clean about them; others the reverse; and with the cleaning of castings as much depends upon the personal disposition as in any other point in our business.

There are foundries in existence which have nothing but the old fashioned scratch brush, and yet turn out better cleaned castings than those having the most modern machinery. Your castings can be made as clean as you demand they shall be, just as your castings are made of such a standard as you demand and your inspector enforces. The inspector is, after all, the one person who controls, and it is upon his judgment that you must depend as to whether your castings are properly cleaned or otherwise.

I might say that the first point, or place, in which you start to clean castings is on the molder's floor; if you use such care in the selection of iron, sand and facing that the sand will not burn to the casting, but will scale easily from it, in fact so that a goodly portion of the sand is rapped off by the molder, you have accomplished just so much in the cleaning.

Early Methods of Cleaning Castings.

The old fashioned method was to use a wire scratch brush, made of No. 16 to No. 28 wire done up in a mass, with which a man brushed the sand from the casting.

Then mills came into use, which were made hexagonal or round form, either of iron or wood, and each mill driven by its own belt from shafting suitably placed. The castings were packed immovably in these mills with small shot iron placed between them, and the movement of these shot when the mill was revolved rubbed the sand from the casting.

Since then they have experimented with square mills and some claim for them great advantage, as they are much easier packed, and more work and larger castings can be placed in them, and with much less liability of breakage and with generally better results in cleaning.

Of late years, however, they have introduced great improvements in this respect, in the form of sheet steel mills running on hollow spindles. The outer cases of these mills are perforated, not to allow sand to escape, but to allow air to enter, which is drawn in by a suction fan so placed as to suck the air through the openings in the outer shell, which carries the dust and sand through the spindle, and forces it through proper tubing and deposits it at any given point desired.

In these mills they use small star shot made of exceedingly hard iron, which are known by the name of "steel shot." These have five or more points with sharp edges, which enter into all deep carving and interstices, when the mill is not too closely packed, and the dust is drawn away by the fan, and the castings come out exceedingly clean, and if run for any length of time the rubbing of the shot brings the graphitic carbon in the iron to the surface, thereby making a very high polish which, when touched with the hand comes off with all the effect of black lead.

These mills are so made that they can be run in couples back to back from one shafting, and are started or stopped by a friction clutch, and in some cases they are so arranged that as high as four couples or eight mills are run in the same form. The only drawback I have ever heard in regard to these mills is the trouble experienced by the sand getting into and cutting the bearings of the machinery, thus causing considerable expense for repairs.

Churns.

There is also a class of mills known as churns which do most excellent work. They are cheap, and, in the writer's opinion, exceedingly profitable. These mills should be placed over a pit or cellar, walled in so as to retain the dust and dirt. Preferably these should be made large enough to contain a week's supply of sand, with openings at bottom for the purpose of removing the same. A driving shaft is made long enough to carry ten or less of these churns On these are placed flanged wheels about 8 inches in diameter, made with chilled face. A loose shafting extends over the length of one mill, which is made, say, 30 inches long and from 10 to 24 inches in diameter, and bearing wheels placed to match those of the driving shaft, the top of both sets of wheels running level with the floor. The mill is made so that the heads of the mill rest upon the wheels and is driven by friction. The mill is rolled off these bearings on to the floor, opened and packed. When I say packed, I mean the castings are put in loosely. The shot used are star shot, and are never removed. The mill is closed up, rolled on to the friction rolls, started and allowed to run for one, two or three hours, or such time as is necessary to clean the work. The expense of running is very small, consisting principally of the lining up of the shaft once a year, while the mill itself will wear from two to five years, and the repair work outside of the shafting cuts a very small figure.

These are largely in use in our part of the country in malleable iron shops, hardware shops, &c., and are considered very desirable.

The Acid Bath.

There has also recently been invented an acid, the castings being placed just as they come from the molder's floor in a bath of the same The acid attacks the sand rather than the iron, and it is claimed simply scales the castings without eating into the iron. For some characters of castings this would be highly desirable.

I do not think it is necessary in this article to describe or consider the sand blast methods of cleaning, as they have been tried and found wanting, and I do not know of any one who has tried this system who has it in use at the present time.

This covers what is generally known as the cleaning of castings, and I believe covers all I was requested to speak of in this respect, but I consider that the cleaning of castings extends much further than the mere brushing off of the foundry sand which adheres to it, as under the head of the cleaning of castings comes the counting and inspection of the work.

Counting and Inspection of Work.

There are some shops who count the work in the gangway in front of the molder's floor, and who discount from the cleaning room after inspection. This method has its advocates.

Another method is to count the work after it is cleaned—that is to say, the work is carefully sorted, all the plates belonging to each stove being placed in separate piles, and an inspector or ware boss counts the parts and the molder receives credit from this count.

Still another way is not to count the work at all; simply clean it and put it on the work room shelves. When the stove is mounted, the molders making this stove are credited with the number of parts of their work required to mount the stove. To illustrate: The No. 8 Starlight cook stove is in the sand. It is divided among four molders, who make parts for a number of stoves. Molder A's parts amount to $0.96 for one part, molder B's $0.87, molder C's $0.91, molder D's $0.90. When the mounter takes the work from the shelves to mount say eight stoves, molder A is credited for 8 × $0.96, $7.68; molder B is credited for 8 × $0.87, $6.96; molder C, 8 × $0.91, $7.28; molder D, 8 × $0 90, $7.20. This seems to be a perfectly fair method, as it requires the molders to make their work even, as no work is counted unless it is even. Where odd work is required under this system, it is taken from the shelves, notification being given the foreman, who sees that the extra parts necessary to even it up are made, the molder being paid for such extra parts.

While this plan works very advantageously to the manufacturer and also to the molder, yet the feeling exists that he is not getting paid for what he does, especially when the end of the week comes and he has parts left on the shelf, owing to his partners on the job not having their parts even with him. Yet the experience of those who use this system shows that molders receive as good wages by this system as by any other; the disadvantages, if any, being to the manufacturer, caused by forcing work through to keep the stoves even.

The cleaning of castings cuts a very large figure in the general results of the manufacture. I would state that I have known parties making first-class stoves, as far as molding, mounting and trimmings were concerned, but they were careless in their cleaning, and I have heard dealers say: "Why, their stoves are of no account; they do not even brush the sand off their castings."

Castings for Nickel Plating.

After the castings have been cleaned in any of the manners aforesaid, there are many of them that require to be nickel plated. These are placed in mills of the exhaust character, and remilled with sharp, new star shot, and thus made absolutely and positively clean and ready for the polisher. This method, which, I think, is generally used, is probably the cheapest method possible. This would cover the cleaning of them for japanning as well.

There is also a water mill very largely in use, which is used to polish small castings, such as turn keys, shakers, lifters, &c. The mills are made either of the cylindrical form, with a man or hand hole through which to place the castings, and which is closed with gum gaskets in the same way as the man or hand hole of a steam boiler. Being water tight, water is placed in them before closing, together with sandstone spalls or small pieces of granite.

Others make these mills in an egg shape in two pieces united at the center, where they are not tight, and run them in a tub of water, the water entering the crevices in the center; and the castings being, by the shape of the mill, thrown outwardly and then inwardly, receive their polish in this way.

Both of these forms of mill are doing good work. The castings, to fit them for nickeling, should be allowed to remain in the mills and kept moving from two to six days, according to the character of the work.

Castings which require to be nickel plated also require buffing, and as grease is used on the buffing wheels it often deposits on the background of the castings, requiring them to be cleaned. Soft soap and hot water is probably the best method for cleaning these. We have tried many cleaning compounds, articles which are much more expensive, but find the above is preferable.

In conclusion, I would state that a sufficient quantity of mills—that is, enough so that the work can be kept in them long enough to become properly cleaned—is highly advisable, and it is of the utmost importance that work should not be removed until it is absolutely clean, thus saving the expense attending upon the handling and rehandling of the work, which would otherwise be necessary.

MORAL: Put up more mills than you want and good ones.

* Read at the convention of the National Association of Stove Manufacturers, held in Chicago May 2 and 3.

THE GEM CITY STOVE MFG. COMPANY of Quincy, Ill., are the assignees of a patent recently granted to F. Kaempen, Jr., and covering a device for operating oven shelves. The invention relates to stoves having oven shelves or pan supports which are moved in and out by means of a connection with the oven door. The object of the present device is to secure a simple, convenient, durable and economical means for moving the shelves or pan supports outward in a straight line as the oven door is opened and without danger of any binding of the parts. It is also intended to provide a means whereby the device when disconnected from the door, and the shelf withdrawn or slid outward, may be automatically set or shifted into correct position to connect with the door by the inward sliding movement of the shelf.

The Education and Production of Finished Workmen.*

BY H. D. KELLER.

Before entering on this subject let us consider of what the qualifications of an efficient workman consist.

A person, in order to be efficient at anything, must possess a practical knowledge of all details in connection therewith. While one possessed of such knowledge may be a capable workman, there are a number of things that may cause him to be undesirable. He may be quarrelsome or continually causing trouble, or may on account of carelessness be the cause of great loss to his employer, or he may be the possessor of that unquenchable thirst of which so many unfortunately are the victims. It is therefore plainly to be seen that the standard of desirability cannot be based on efficiency alone.

Now let us see whether or not our workmen are efficient. A look over the patterns of the range or heater that has been in the sand but a few months, or a glance over our broken and discounted castings, brings us to the natural conclusion that their standard of efficiency is low. As it is an undisputed fact that the standard of ability among workmen of the past was far superior to that of workmen of the present day, we naturally look for the cause of this depreciation of ability.

The "Whole Stove" Plan.

Some years ago molders worked on what is kuown as the "whole stove" plan; that is, one molder made a whole stove each day, or else two or more worked in conjunction, aud in either case were only paid for complete stoves. Under such conditions the loss of a casting was something to be avoided; the natural tendency would cause a molder to be cautious. A poor workman under this system could not hold a job, much less work with a gang that had a set of patterns split up between them, and in consequence there was a scarcity of poor molders; there was also another advantage in this system, and that was a desire on the part of one molder or gang of molders to turn out superior work to that made by others, as the stoves on a whole would show up for or against them.

The larger foundries in later years discontinued the system because there was such a demand for certain stoves that molders in many cases would work on one pattern the greater part of the year. The natural result was a lot of bottom molders, top molders, oven door molders, flue strip molders, &c. Under this system the loss of a casting on the part of the molder was only its piece price value, and consequently the ability of the molder as a general workman fast depreciated. He naturally became more skilled in making the piece he was working on, and as a result did a larger day's work than he had formerly done under the whole stove system. This fact could not escape the ever watchful eye of their employers for any great length of time, and the result was a reduction of wages Now it is a fact where there is once a price made on a piece of work the workman either concludes that he is getting what it is worth to make, or that he is getting less—never more; when this price is reduced he concludes that he is getting less than the piece is worth, and in consequence puts less labor on it, which must result in inferior work. This has been the experience of foundrymen after strikes caused on account of a reduction in wages, and it has always taken a long time to again get the quality of work to the same point of excellence that it had before the reduction took place. And in many cases the same results have not been obtained even after a lapse of years. With workmen produced under the straight job system, is it to be wondered at that they cannot do what was accomplished in former years when the change that has taken place in the stove business in the last few years is taken into consideration? Competition has forced manufacturers to make such a large and ever changing variety of stoves that even the skilled molders of the past would find it difficult to come up to their former point of excellence. Patterns are not given the finish they received in former years, as the expense of doing so would soon eat up what little margin there is yet. This also helps to keep down the quality of work produced. Where stoves can be kept in the sand the year around there is very little cause for complaint on account of inefficient workmen, but as the demands of the trade are such that this cannot be done we need go no further looking for a remedy with our molders. We must look for a remedy in the production of molders of a superior class, and to do this we must start at the foundation—namely, the educating of our apprentices.

Educating the Apprentice.

Men and boys can be classified as follows: The know-nothing class, among which we find those that, although they may be young in years, have long ago outgrown their period of learning. They know it all. No matter how much thought and study you may have given the subject, they will surely try to convince you that they know more about it than you do. There is another class who are ever on the lookout for more information and knowledge. They find others engaged at the same occupation who, in their estimation, are superior workmen to themselves. It is this last class that possess the qualifications desirable in an efficient workman; and it is of this last named class only that we can produce capable workmen.

The first and most important step is to select only those that have the necessary qualificatious to make them desirable. An active temperament, a desire to learn and a good, strong constitution are things that are most essential. There are, of course, numerous other features that are desirable; but we are not looking for angels among boys desiring to learn a trade. We will make mistakes at times in selecting boys, and when we find such to be the case it is well to drop them at once. Two weeks ought to determine, in most cases, whether or not a boy is desirable.

The Instructor.

Having selected desirable apprentices, our next step is to make thorough workmen of them, or rather lay a foundation with that object in view. To accomplish this we require a competent instructor, who, in addition to being a first-class workman, should also possess the faculty of knowing how to get the best results out of those he may have in charge; he must know how to study their various dispositions; he should know when a few words of praise can be bestowed to good advantage; he should know that the secret of success in teaching lies principally in knowing how to work on the learner's ambition, and as it is a well-known fact that "ambition likes praise, not flattery," it becomes evident that it must dislike the negative thereof, which is fault finding.

No matter how ambitious and willing the learner may be, or how good at learning, he will make mistakes, and in such cases it requires good tact on the part of the instructor to do the correcting in such a way that the ambition of the learner will not be cooled; it can be done in a very nice way by pointing out the excellent work done by some one else, and the natural result will be a desire to excel.

Instructors must not expect the learner to know as much in a few months as it took them years to acquire. Beginners must never be crowded, but instead must be taught how to make every move count. They must have a reason given them why work should be done in a certain way—in fact, a reason for everything. If this is not done they are liable to find some other way of doing it.

No mold should be closed that is not perfect. Don't ever let a boy understand that anything short of perfect work is good enough. No good results can be obtained any other way.

Teaching a system is of the utmost importance. System means the most work obtainable with the smallest amount of labor, and it further means neatness, a place for everything and everything in its place.

Object of Learning a Trade.

It must be remembered that there is but one object in learning a trade, and that is to earn money, and that all those learning have that object in view. It must, therefore, be demonstrated that the journeymen in the shop earning the most money are those who have the least loss and do the best work, and that there is only one way to accomplish this, and that is in learning the best way to make everything.

Where it could be done a great help would be an evening class for boys, where everything in connection with the production of stoves could be taught, as well as mechanical drawing, geometry and algebra; these last named branches tend to strengthen the reasoning faculties. Practical demonstrations in the shape of lectures would also be of great benefit. The thorough education of apprentices in the art of molding cannot be too strongly insisted upon. It is nearer an art than it is a trade, and the apprentices we turn out will ever carry our trade-mark in the shape of their abilities; and it is a certain fact that the class of work made in any shop can be judged by the class of molders turned out. Apprentices left to shift for themselves, as a rule, will only excel in one thing—that is, their ability to keep up a good supply of scrap.

In a small shop the foreman finds time to instruct, and in larger ones, where from 10 to 30 apprentices are employed, it pays to have a good instructor. We may see the money paid an instructor on the pay roll and feel that we may pay it out without getting adequate returns, but it is a wrong conclusion, as the labors of that instructor will show in the increase of the earnings of our apprentices, as well as in the quality of their work.

As a whole, a good instructor with capable apprentices and constant oversight and assistance by the employer will certainly produce efficient workmen.

* Read at the convention of the National Association of Stove Manufacturers, held in Chicago May 2 and 3.

Selling Stove Repairs.

"We have any number of amusing experiences, although some of them would try the patience of a saint," said a Chicago dealer to a newspaper reporter. "People will come to us who think we have enough information if they give us the name of their stove. An Irishman walked into our place the other day. He was one of those positive Irishmen who think it impossible to make a mistake.

"'Good mornin',' he began. 'Oi waa laid off yisterday, an' Oi just came down to git some fixins for the stove. The ould woman's been lackin' for a new back this long tolme.'

"'What kind of a stove is it?'

"'O, just a common ivery day stove.'

"'Does it burn coal or wood?'

"'It's a coal stove an' burns a divil of a lot of coal. Sure, it takes the best part of me wages buyin' coal.'

"'What is the name and number of it?'

"'No. 8 Star.'

"'Are you sure?'

"'Am Oi sure? Of course Oi'm sure. D'ye suppose Oi've sat in front of it for the last eight years an' not know what kind of a stove it is? Phat do you t'ink Oi am, a choomp?'

"'But there is no such stove made.'

"'Is that so? Maybe you t'ink you know more about it than Oi do an' ye niver sane the stove at all, at all'

"'Are you sure it isn't a Star No. 80?'

"'Sure? Of course Oi'm sure. Oi wouldn't have come down onless Oi knew phat Oi wanted. If you haven't got a No. 8 give me what you have got and Oi'll make it fit.'

"'But there are several kinds of Stars. Who is the maker, what is the date of the patent, and what is the size of the oven?'

"'An' do you have to know all that? Sure, the next toime Oi come down for a job loike this Oi'll aind some one else.'

"Then there is the 'handy' man, who comes in with a piece of string or a stick. There are knots in the string and nicks on the stick to show that the stove is 'so long and so deep.' When we tell him what is necessary before he can be accommodated he beats a hasty retreat. And there is the lady who thinks we are 'just horrid' when we tell her that we don't know what kind of a stove she has, that there are between 70,000 and 80,000 for which we have repairs, and that hers might be any one of them.

"The other day a German who keeps a second hand store was in here for some parts to two stoves that he had bought. He could not speak English very well, and as near as the clerk could make out the names of his stoves were the 'Sausage' and the 'Maggots.' As no such stoves were made to our knowledge, we were somewhat puzzled. Finally the catalogue was resorted to and the German triumphantly pointed out the names of his stoves. They were the Success and the Magnetic.

"Occasionally a man of the Spoopendyke order comes in. He wants a water front. He has the name and the details all right, and we give him tho part and suggest that we send a man to put it in for him. He declines our assistance, says he is used to these little jobs. He enjoys them. Besides, he isn't as big a fool as some people, who pay a man to do a simple little piece of work when they could save the money by doing it themselves. Next day he comes in crazy and wants to know what we mean by giving him the wrong front. Upon investigation it appears that he has taken out the fire brick all right, but has neglected to remove the shell, which makes the water front too large by about an inch.

"If people would be more particular to give us the right information they would have less trouble in having their stoves repaired."

ODD PLATES.

A "HARD TIMES" envelope of brown paper is used by the Michigan Stove Company in notifying their customers that a call will shortly be made by one of the company's salesmen. A sample of the notices thus mailed has been received. It is printed on parchment in two colors, red and black, and bears a remarkably strong resemblance to the ancient work of the early printers. The outside page of the notice has the word "coming" in bold letters, surrounded by an engraved design in leaf work. On the inside page the name of the salesman is given whose visit is to be expected. The whole arrangement is unique and attractive.

WEIR STOVE COMPANY, Taunton, Mass., are bringing out two sizes of a new square parlor stove known as the Grand Glenwood, highly ornamented both in the castings and nickel work, and designed for a high grade stove.

GEO. L. ROOD, representing the Royal heaters, manufactured by Hart & Crouse, has removed to 79 Lake street, Chicago. His new quarters are on the ground floor, presenting improved opportunities for displaying his goods and greatly facilitating the dispatch of business.

B. W. DODSON, late second vice-president of the Detroit Stove Works, has retired and is not now connected with the stove business, in which he has figured so prominently for years.

TAUNTON IRON WORKS COMPANY, Taunton, Mass., continue to offer the Quaker Prize range in four sizes, fitted with either plain, draw center or triangular grate, and having, it is claimed, a perfectly ventilated oven. This concern are sending to their customers a life sized *papier-maché* figure of a Quaker, which is very durable and makes an excellent show card for inside or outside use.

W. M. SHADDINGER, secretary and Western manager of the Detroit Stove Works, has removed to Chicago and will hereafter give personal attention to the details of the Chicago branch house, at 2921 to 2929 La Salle street.

THE EMPLOYEES of the Corning Stove Company, Corning, N. Y., expressed their pleasure at Postmaster Drake's confirmation, recently, by a vigorous use of the whistle attached to the plant.

THE BUSSEY & MCLEOD STOVE COMPANY, at Troy, N. Y., shut down their plant last week owing to the fact that orders were slack and some difficulty was experienced in getting coke.

THE NEW YORK STOVE WORKS, Peekskill, N. Y., are sending out circulars showing their varied line of gas hot plates, sad iron heaters and ovens. They are also making a portable gas appliance that is adapted for use with coal ranges, both for cooking on the top and baking in the oven.

THE STORE of the Mount Penn Stove Works of Reading, Pa., at 111–113 North Second street, Philadelphis, Pa., makes a fine display of gas stoves, gasoline stoves and refrigerators, their coal ranges being attractively arranged to create a demand at a later season of the year.

NORTH DIGHTON CO-OPERATIVE STOVE COMPANY, North Dighton, Mass., will soon bring out in all regular sizes a new medium priced range, known as the Oakland A. It will be fitted with any style grate desired and will have a nickel top rail and an elevated shelf.

F. M. BORDEN & BROTHER, 118–122 North Second street, Philadelphia, Pa., note a substantial increase in the demand for gas cooking apparatus this year. They make a specialty of the Reliable gas ranges and Game gas hot plates. These, with gasoline goods and the Challenge Iceberg refrigerators, furnish them a lively trade. The Erie aluminum tea kettle is attracting considerable attention with their trade, and increasing sales are the result.

J. ELWOOD YEAGER, manager of the Yeager-Hunter Spring City Stove Works, at 56 North Second street, Philadelphia, Pa., is showing a new range of the New Era series. It is a high oven square range of handsome appearance. The new features are sheet flue construction, which insures satisfactory operation, and a cut top, which avoids the possibility of the top cracking from heat, and is so constructed as to preserve the top level continuously. The range has a handsome nickel name plate and a nickel hearth, will all the conveniences and appurtenances of high grade goods.

THE CORNING MFG. COMPANY of Corning, N. Y., are meeting with a good demand for the Victor hot air furnace, which they manufacture and which has now been on the market for a little more than two years. Last season the sales in Corning of the heater were about two and a half times those of the year before. The business is growing to such an extent that the manufacturers have added a larger size to their assortment—the varieties now including Nos. 40, 43, 45, 50 and 60. A folder which reaches us from the company illustrates and describes the Victor hot air furnace, and also gives a few of the names of those who have used the heater.

WHITE, WARNER & CO., Taunton, Mass., report a very good sale for their new range, the Household Star, a medium priced stove made in two sizes and fitted, as are all Household ranges, with the White patent grate, which sifts the ashes and shakes the fire thoroughly at the same time.

ROBERTS, WINNER & CO., proprietors of the Quakertown Stove Works, Quakertown, Pa., have added to their assortment of goods two new ranges and a parlor stove. The latter, known as the Menlo, is made in two sizes, either straight draft or revertible flue. The ornamentation is of a pleasing character, the nickel top being so arranged that it may be taken off without removing any bolts or nuts. The new ranges are the Belmont and the Tip Top. These embody the modern improvements, are decorated in an effective style and are offered in several sizes. The goods have been well received during the short time they have been on the market, and the manufacturers expect for the Menlo a hearty reception upon its first appearance.

THE PORTLAND STOVE FOUNDRY COMPANY, Portland, Maine, have just brought out a high grade range called the Atlantic Grand. It is a high art range, designed in clay, has a new combination, low and high shelf and all the latest improvements in range construction. In ornamentation it is particularly rich and neat, gaudy and cheap looking effects having been carefully avoided. The edges are polished and the name plate nickel.

THE MARCH-BROWNBACK STOVE COMPANY of Pottstown, Pa., have opened a sample room at 312 Cherry street, Philadelphia, under the management of William M. Brownback, where they are showing a full line of all sizes of Crown hot air furnaces, steam heaters and hot water heaters. The location is a good one, and the new departure will undoubtedly be appreciated by the trade and others desirous of examining and placing orders for Crown heaters.

THE DETROIT STOVE WORKS of Detroit, Mich., are represented by a Jewel gas range in operation at the Pure Food Exhibition now being held at the Auditorium. The stove is situated in the kitchen, in the gallery of the exhibition, where the cooking of all foods required in the demonstrations is done and lectures on high art cookery given by Mrs. Rorer.

R E DIETZ COMPANY, 76 Fulton street, New York, report an increased demand for gas cooking apparatus, and are displaying a line of Dangler, Quick Meal and Cort ranges, besides a variety of hot plates and gas cooking appliances. They are showing the Dietz oil stove in all its various forms and report good sales.

THE EXCELSIOR STEEL FURNACE COMPANY, Chicago, Ill., shipped to Boston this week a carload of their furnace fittings, and included in the shipment a large number of oval stacks which they got up especially for the Eastern market and will hereafter make and carry for the Eastern and New England trade.

AT THE ANNUAL CONVENTION of the Western Gas Association held in Cleveland recently an interesting feature was the exhibition of gas burning appliances. The display was arranged in Army and Navy Hall and included exhibits by George M. Clark & Co., Schneider & Trenkamp Company, Standard Lighting Company, Cleveland Foundry Company, Wolff Gas Radiator & Mfg. Company, Dettlebach Stove Company, Taylor Burner Company, Miller Grate Company, Van Wie Stove Company, Maryland Meter Company, Milwaukee Gas Stove Company, Dan-

gler Stove & Mfg. Company, Favorite Stove & Range Company, Triumph Heating & Lighting Company, Gas Appliance Exchange, Western Gas Connection Company, Sloss Electric Gas Lighter Company and the Chicago Gas Stove Company.

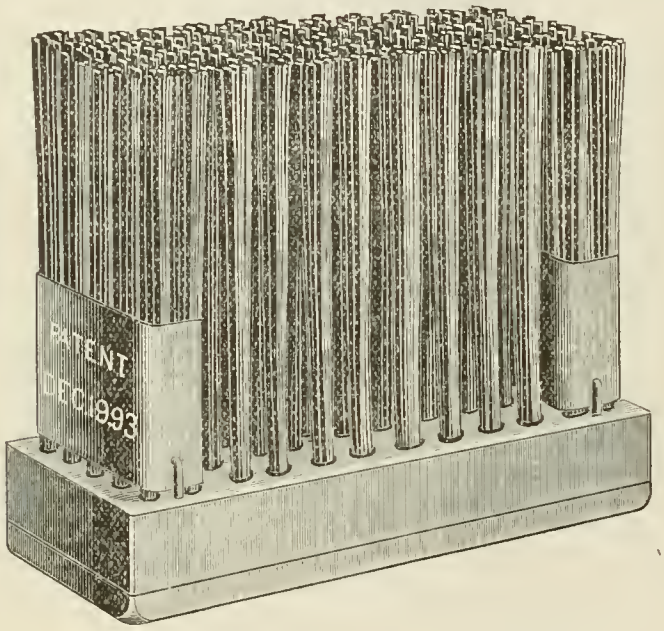
EDWARD ATKINSON of Boston, Mass., has issued an eight-page pamphlet descriptive of a new cooker which he has recently devised. The apparatus is referred to as being the most simple and effective, with the exception of what is known as the Standard Aladdin oven, which the inventor has brought out, and it is illustrated by means of sectional views in the pamphlet mentioned. The new cooker consists of a tin lined wooden box 1 or 2 inches thick, and designed to be placed bottom up on a metallic table, to which it is hinged. In the center of the table over which the box is placed is a hole 2½ inches in diameter, through which the top of a lamp chimney projects. Over the hole in the table is a double tube which is open at the bottom immediately over the top of the lamp chimney. The upper part of the tube supports a plate, the arrangement being such that it may be turned upon the lower tube so as to permit the heat from the lamp to pass directly into the box through openings provided for the purpose, or the upper tube may be turned upon the lower one so as to close the openings. In operation the box is tipped up and the cooking vessel placed upon the plate supported by the tube over the opening in the table, after which the box is lowered into position, forming an oven which, it is claimed, gives very satisfactory results.

EDWIN A. JACKSON & BROTHER, 50 Beekman street, New York, are displaying some handsome pieces of artistic wrought iron work. These goods comprise picture frames, easels, lamps, chandeliers and lanterns, fire stands, wood holders, and various designs of fire dogs. Three very handsome fire dogs represent storks and dragons. A set of dragon andirons in their window is particularly handsome in the dead black finish and gold bronze.

THE NEW YORK OFFICE of the Matthews & Willard Mfg. Company, 40 Murray street, in charge of F. M. Randell, makes a handsome display of onyx lamps, tables and cabinets and artistic metal goods. The house makes a full line of bronzes, urns and ornaments for stoves and stove trimmings in addition to the attractions shown at this branch.

Rice's Patent Bridled Foundry Brush.

It is a well-known fact that the drawn steel wire employed in foundry brushes is apt to break at the ends. The breaking at this point is greatest, owing to the fact that the wires are more free to vibrate than in the center, where they are largely prevented by contact with each other. If there was no more vibration at the ends than at the central portion of the brush, the end wires would break no sooner than the others, and the whole brush would wear uniformly until too short for further use. For the purpose of remedying this difficulty, the Rice Mfg. Company of New Durham, N. H., have placed a band or bridle around the end rows of the brush in such a way that while hinged to move freely and retain all the flexibility of a common brush, it catches the outside wires as they spring forward and immediately stops the vibration, which would otherwise continue. From an inspection of the engraving which we present herewith, it will be noticed that the bridle is fastened to the block in such a way that it can move freely on the hinge points. The manufacturers state that this device is cheaply applied and adds greatly to the durability of the brush, tests showing this durability to be twice and in some cases three times that of an ordinary brush.



Rice's Patent Bridled Foundry Brush.

The contract by which the Panama Railroad Company have been operating the steamers of the Pacific Mail Steamship Company, plying between New York and Colon, expires in June, and will not, it is announced, be renewed. The Panama Railroad officials have made arrangements to charter the three steamers of the late Brazil Mail Steamship Company, and now owned by the Standard Oil Company, from June 15. It is not unlikely that the move may lead to a sharp rate war.

Utilizing Blast Furnace Slag.

The disposition of blast furnace slag has long been a source of considerable trouble and expense to blast furnace operators, especially to those concerns who are compelled to remove it a considerable distance from the furnace. However, if a process for the utilization of this slag, shortly to be tried at the blast furnaces of the Edgar Thomson Steel Works, at Bessemer, Pa., proves successful this trouble and expense will not only be removed, but will enable the pig iron maker to realize a profit instead. In February last the Carnegie Steel Company, Limited, placed a contract with the Roberts Mfg. Company of Pittsburgh, builders of steel link belting conveying and elevating machinery of all kinds, for the construction of some elevating and conveying machinery of special design. This machinery has been completed and delivered at Bessemer, and is now awaiting a preliminary test, which will be made just as soon as some necessary changes in the railroad tracks, now under way, have been completed. With this machinery it is proposed to take the slag from Furnace D and treat it in such a manner as will make it suitable for railroad ballast, foundations, roadways and other purposes. Briefly, the process consists in taking the hot slag into a series of iron pans, from which it is conveyed to a crusher, where it is broken into cubes 1¼ inches in size. After being reduced in this manner it is taken to a horizontal pan conveyor, which delivers it to an elevator. It is then delivered to a shaking grate, which clears away all dust and dirt, after which the material is loaded on cars run under the elevator and is ready for shipment. Should the initial test prove successful, contracts will be placed for such additional machinery as may be required to treat the slag from the nine furnaces at Bessemer. The machinery now awaiting test is said to be capable of taking care of 300 tons of slag per day.

The largest check valve ever made has just been completed at the works of the Ludlow Valve Mfg. Company, Troy, N. Y., to be used in the main water supply pipe in the city of Pittsburgh, Pa. The total weight is 52,375 pounds. The valve was cast in two sections, which when bolted together made the valve stand 13 feet and 7 inches high, its greatest circumference being 32 feet 6 inches. The iron of which this valve was made when tested showed a tensile strength of 34,450 pounds per square inch. The bronze showed a strength of 39,250. The thickness of iron in this valve was $4\frac{7}{16}$ inches. Under a pressure of 500 pounds per square inch, the actual pressure on the gate plate of the valve was 3,454,325 pounds. During the recent depression in business this company have been running on full time with a full force of men.

Judge Coxe of the United States Circuit Court of Southern New York, has granted an interlocutory decree at final hraring perpetually restraining William D. Hoffman from infringing the patents 404,332, 430,058, 465,349 on magnetic separators granted to Clinton M. Ball and Sheldon Norton, the property of the Magnetic Separator Company.

At a sheriff's sale lately, in Reading, Pa., the franchises, property, &c., of the Reading, Lancaster & Baltimore Railroad were sold for $65.

TRADE REPORT.

The Iron Market.

The fuel question is the one of absorbing interest to the Iron trade throughout the country. The scarcity of Coke has led to the closing down of all but a few of the furnaces in Pittsburgh, all in the Mahoning Valley and the Wheeling district, all but one in the Shenango Valley, and nearly all in Central and Northern Ohio. It is really only the Chicago district among all west of the Alleghany Mountains which has not been affected.

An increasing number of mills in the West are idle or are close to the end of their fuel supply, and some of the Eastern mills are finding it very trouble some to get enough gas coal for their producers. The result is that prices along the whole line of Finished Iron and Steel are firmer, and for the time being cut throat quotations are not being made. But as yet there has been no general or substantial advance, nor any improvement in price in proportion to the rise in values on spot raw material. Buyers show very few symptoms of alarm, and sellers are by no means confident. In many cases the fuel shortage, which restricts production, acts also in curtailing consumption.

It remains to be seen whether the deferred demand will be large enough when the trouble is over to keep the furnaces and mills so busy for a considerable period that they can hold out and get higher prices. Each week of enforced idleness will add to the chances in that respect, but as yet only the first feeble indications of it have appeared.

It is probable that a determined effort will be made at an early date to get the Connellsville Coke ovens into blast. So far as the soft Coal situation is concerned, the general conviction is that little can be expected in the way of settlement from the Cleveland conference.

Pig Iron.—There is a little more inquiry in the New York market, and on the part of sellers a tend ency to abstain from forcing the market. Foundry Coke is getting scarce, which is interfering with melting. Negotiations are pending for round blocks of Bessemer Pig. We quote standard brands $12.50 @ $13.25 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.75 @ $10.25.

Philadelphia advices indicate no special change in Foundry or Mill Irons, the supply being large, the demand light and sellers anxious for business. Prices vary according to circumstances, but standard brands command about last week's figures, say $11.50 for No. 2 X and $10.50 for Mill Irons, some a little more, some a little less, according to quantity, quality, delivery, settlements and other considerations incident to each particular case. General quotations for Philadelphia and near by points are about as follows:

Standard No. 1 Foundry X	$12.50 @	$12.75
Standard No. 2 Foundry X	11.25 @	11.75
No. 2 Plain	10.75 @	11.00
No. 1 Soft	11.50 @	11.75
No. 2 Soft	10.75 @	11 00

In the Chicago market sellers of local Coke Iron report that they have just had the best week's business for a month. It has not grown out of a general improvement, however, but the business has been placed by foundrymen here and there who have secured more orders for their products and are consequently covering their requirements. Good inquiries are still in hand, and prospects are excellent for a continuance of the buying movement. Concessions in prices are no longer being made, but on the other hand some effort is perceived to mark prices up a trifle. Southern Coke Iron is quiet, but some figuring is being done on a few fair sized inquiries. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @	$15.50
Local Coke Foundry, No. 1	11.25 @	11.50
Local Coke Foundry, No. 2	10.50 @	11.00
Local Coke Foundry, No. 3	10.00 @	10.50
Local Scotch	11.50 @	11.75
Ohio Strong Softeners No. 1	12.60 @	13.50
Southern Silvery, No. 1	@	11.50
Southern Silvery, No. 2	@	11.00
Southern Coke, No. 2	10.00 @	10.35
Southern Coke, No. 3	9.75 @	10.00
Southern, No. 1, Soft	10.25 @	10.50
Southern, No. 2, Soft	9.75 @	10.00
Tennessee Charcoal, No. 1	15.00 @	15.50
Tennessee Charcoal, No. 2	14.50 @	15.00
Alabama Car Wheel	17.85 @	18.00
Jackson County Silvery	15.00 @	16.00
Other Ohio Silvery	12.50 @	13.00

The very limited demand for Foundry Iron in the Pittsburgh district has prevented any advance being obtained for it. A number of furnaces in the two valleys that have heretofore made some Foundry Iron will run on Bessemer altogether when the Coke strike is ended. They say the demand for Foundry is so limited that it does not pay any longer to make it. The supply of Bessemer Iron in Pittsburgh and vicinity is about exhausted. Quotations are given as follows for close delivery:

No. 1 Foundry	$11.10 @	$11.25, cash.
No. 2 Foundry	10.50 @	10.75 "
No. 3 Foundry	9.75 @	10.00 "

Our Cincinnati reports indicate little change in the Pig Iron market at that center. Consumers who have Iron coming to them on contracts are a little more urgent to have them filled, and there are no large offerings for present or forward delivery. There is no difficulty in obtaining enough material to meet the current demand, which is of a jobbing character. There is no large consumption; even the Iron Pipe works are melting comparatively little Iron. The Stove works are working on short time. Agricultural works are doing comparatively little and contemplate an early season, so that the reduced output of Pig Iron by the furnaces is not causing the hardship to consumers which might have been expected. The demand is mainly for Coke Foundry Iron. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke, No. 1	$10.25 @	$10.50
Southern Coke, No. 2	9.25 @	9.50
Southern Coke, No. 3	8.75 @	9.00
Ohio Soft Stone Coal, No. 1	14.50 @	15.50
Ohio Soft Stone Coal, No. 2	14.00 @	14.50
Lake Superior Coke, No. 1	12.50 @	13.00
Lake Superior Coke, No. 2	11.50 @	12.00
Hanging Rock Charcoal, No. 1	17.00 @	17.50
Hanging Rock Charcoal, No. 2	16.50 @	17.00
Tennessee Charcoal, No. 1	13.00 @	13.50
Tennessee Charcoal, No. 2	12.00 @	12.50
Standard Southern Car Wheel	16.25 @	17.00
Lake Superior Car Wheel and Malleable	16.25 @	16.75

There is no large business doing in the St. Louis Pig Iron market, where the Coal strike has had a hardening tendency on prices. The consumption of Iron is not heavy, many concerns running only half time and others even less. The local Stove manufacturers are not melting much Iron, and judging from the stocks of finished goods they have on hand, will not be compelled to increase their consumption of Iron very largely. The outlook is a trifle better, but cannot yet be called encouraging. Quotations are as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.75 @	$11.00
Southern Coke, No. 2 Foundry	9.75 @	10.00
Southern Coke, No. 3 Foundry	9.50 @	9.75
Southern Car Wheel	16.75 @	17.75
Lake Superior Car Wheel	16.25 @	16.50
Ohio Softeners	14.25 @	14.50

Metal Market.

Pig Tin.—Prices have dropped somewhat and the market shows rather unsettled tone, attributable in part to lower London quotations by wire. The arrivals here have been fairly large, amounting in the past week to 425 tons. This, with 550 tons reported cleared from English ports, would seem sufficient to relieve anxiety of any immediate shortage in the supply in this market. Buying for consumption is referred to as being of very moderate volume. Jobbers' prices for small lots have been reduced to 20¼¢ @ 21¢ per lb for Straits Pigs and 21½¢ @ 22¢ for Banca.

Copper.—Slow business, tame interest on the part of buyers generally and rather soft undertone to values covers about all that there is to be noted in the way of feature so far as the local market is concerned, but lower London quotations are, at the least, slightly significant as bearing upon the general situation. The appearances are that there is more than enough copper to go around. The ruling price asked by dealers for small quantities of Lake Ingot is 10½¢ ℔ lb.

Sheet Copper.—The demand for Cornice Copper does not expand to any visible extent, and the market is dull and disappointing. Prices are inclined to weakness, while manufacturers are actively seeking orders. Some of the largest Copper works are running only on partial time pending a turn for the better in the demand.

Pig Lead.—The market has been weaker and lower coat has not lubricated the wheels of business in any marked degree. Consumers manifest extreme indifference, orders being, in the main, of a small and insignificant character. American Pig in small lots from store is quoted by jobbers gen-

erally at 3⅞¢ @ 4¢, the bulk of business being done at the lower figure, or even a trifle less.

Lead Pipe and Sheet.—Little beyond a feeble and perfunctory business is noted in Manufactured Lead in this section. The restricted character of dwelling house building operations now in hand gives small promise of any immediate expansion of the demand for plumbers' supplies. No great improvement is looked for in this quarter before the fall. While discounts are nominally maintained at the list rates, prices are said to be inclining to softness in some quarters.

Spelter.—Some effort was made to move prices upward on the strength of reports of smaller production and concentration of supplies, but the market subsequently relapsed in a manner rather surprising to dealers and there has been pronounced softness since, indicating that the available supply is quite sufficient. Besides being weak in tone, the market is dull here, sales being almost entirely confined to comparatively small quantities for present consumption. For small jobbing parcels of ordinary Western Spelter the ruling price is 4¼¢ ℔ lb, with the usual premium on fancy brands. Stocks in first hands are not heavy, and any strong demand would quickly absorb what Spelter there is unsold.

Antimony.—Aside from routine jobbing business little has been done in this metal, and the market is rather soft. In small lots Cookson's is quoted at 10¾¢ and Hallett's at 10¢ ℔ lb.

Nickel.—Prices have undergone no radical change. The extremes are 45¢ @ 55¢, according to size of lot, &c. The demand is of ordinary character.

Tin Plates.—The market has shown little or no improvement over that of last week, although slightly more interest has developed in favored deliveries. Inquiries have, however, crystallized into but very moderate business so far. Can makers seem to be behindhand with their purchases, notwithstanding that canning prospects are reported to have improved. Consumers appear to be postponing the filling of requirements to the last possible moment, in view of tariff changes. Such contracts for future delivery as are made always contain a proviso in regard to duty. Spot business shows no increase in aggregate volume and has been irregular, with very close figuring on prices the rule. If anything, the buyer still holds the advantage, although stocks here are only fair and the assortment rather poor. A temporary scarcity is noted in some lines of imported Plates, particularly those of special sizes. Roofing Ternes show the most activity, and American manufacturers of this material are said to be well supplied with orders. In the West Tin Plates are reported to be moving freely. They are still scarce in the Chicago district, and jobbers are regularly advising their traveling men of actual stocks on hand, so that no sales will be made which cannot be immediately filled from stock.

Sheet Iron.—Although jobbers in this vicinity speak of almost absolute stagnation in the demand for Sheet Iron, the mills are said to be well supplied with orders, and are mostly reported as busy. Scarcity of fuel, in consequence of the strikes, is likely to cause the shutting down of some of the mills, however, within the coming week. On the strength of a threatened contraction of output prices for galvanized sheets have hardened during the past week, and Black Iron makers are also said to be contemplating an advance.

Chicago Report.

Scrap.—The trade in Old Material shows no sign of improvement. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5¼¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Business is very quiet. The scarcity of soft coal has not yet driven trade to anthracite. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6.75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

Trade Notes.

BURGESS SOLDERING FURNACE COMPANY, Columbus, Ohio, advise us that business for the past three months has been very good, and they refer hopefully to the outlook for the future.

D. M. STEWARD MFG. COMPANY, Chattanooga, Tenn., report the demand for goods in their line as fairly good, orders, while smaller than usual, being more numerous. They state that they are constantly adding to their customers in Crayons and Pencils, and that orders keep coming in at such a rate as to preclude the possibility of getting a stock ahead, the company being sometimes three or four weeks behind orders.

THE EXCELSIOR STEEL FURNACE COMPANY, 38 West Monroe street, Chicago, present some statistics in their advertisement this weeek. They state that over 5,000,000 feet of hot air pipe are used yearly, or over 1000 miles, equivalent to over 3 miles for every working day. They modestly say they would like to make all this pipe, and we believe they are sincere in their wish.

IRA G. LANE, 207 East Sixty-fourth street, New York, sends us an attractive card devoted to the National Revolving Chimney Tops, which he manufactures. These are designed for use on top of chimneys which are troubled with irregular drafts from various causes.

H. H. LINDEMUTH of the Raymond & Campbell Mfg. Company, Middletown, Pa., has invented and is about putting on the market a tool which will readily commend itself to the trade. It is a pipe reamer for beveling the ends of pipe after it has been cut. Few fitters realize the actual decrease of the bore in pipe where the ends are turned up in cutting, and many cases of supposed miscalculations are traceable to this source. With the new tool a bevel is given to the inside ends, which insures an unobstructed connection and consequently a full way. The tool will be made in two sizes, No. 1 cutting pipe from ⅛-inch to 2-inch and No. 2 2-inch to 4-inch. We understand the price of the article will bring it within the reach of the whole of the trade.

J. HERBERT HIGGINS and Caleb M. Andrews have formed a copartnership for the purpose of carrying on the scrap iron, metal and turning business at 79 to 83 Mathewson street, Providence, R. I., under the name of J. H. Higgins & Co.

THE PHILLIPS TIN PLATE COMPANY, makers of tin and terne plates, and F. R. Phillips, have removed their offices to 918 Filbert street, Philadelphia, where they have leased for a number of years more commodious and suitable quarters for the proper display of their manufactures in tin and terne plates and proper facilities for exhibiting the various improvements in tin plate machinery now introduced and to be put on the market at an early date. W. Vernon Phillips will have charge of the tin plate company's department at their new quarters and F. Rees Phillips will assume charge of the company's works. F. R. Phillips will attend to the tin plate machinery, rolling mill, iron, steel and metal brokerage business.

The voyage of the Government torpedo boat "Cushing" from Washington to New York, last week, without touching the waters of the Atlantic, furnished a good illustration of the value of inland waterways for the transfer of war vessels from one point on the coast to another in time of war. The "Cushing" started down the Potomac River to Chesapeake Bay, proceeded up to Chesapeake City and thence crossed by the canal to the Delaware River, continued north to the Delaware and Raritan Canal, and by way of the Raritan River and Bay entered New York waters. She carried weight equivalent to her full equipment in time of war.

As the result of investigations recently made by the Commissioner of Navigation, that official estimates that Americans own and operate under foreign flags a steam tonnage equal to or greater than one-half the steam tonnage registered under the American flag.

Penny in the slot machines have been put under the ban in Chicago.

CONDITION OF THE

Hardware Trade.

THERE is a good deal of complaint on the part of manufacturers and jobbers in regard to the condition of business, the demand being only moderate and considerably less than the average. Reports from the retail trade indicate a relatively better business, though it does not, on the whole, attain to the usual volume. There is a fair demand for seasonable goods, but even these are not going quite as freely as when better general conditions prevailed. There is comparatively little building, though there are indications that there will be an increase in this direction, and Builders' Hardware is perhaps, on the whole, in somewhat better demand. Profiting by the experience of the past year, the trade are pursuing a careful policy and are avoiding purchases beyond their necessities, preferring to keep stocks low, and in some cases broken, rather than incur indebtedness in the discharge of which they may have difficulty. The condition of the market in regard to prices encourages this policy. The trade realize that during the past year, and even since January 1, there has been a perceptible shrinkage in the values of many lines, and they naturally desire to avoid further accumulations of stock, which may possibly be depreciated on their hands. Jobbers and manufacturers generally recognize the wisdom of this policy on the part of their customers, and are in many cases encouraging it by suggestions against overbuying when they see any disposition to do this. At the same time they are willing to make concessions in prices to houses of unquestioned responsibility, and as a result prices to close buyers are somewhat irregular and have on many goods a lower tendency. Comparatively few failures are reported or apprehended, the trade generally being regarded as in a sound and healthful state financially. The effect of the strikes is being felt to an increasing extent, and may have an important influence on production and prices of goods which lie near the raw material. The question as to the probable future course of the market is a difficult one, deserving careful attention on the part of the trade. Prices in many lines are exceedingly low, and it may be that in some cases they have touched bottom.

Advices from Chicago.—The volume of business in Shelf Hardware continues about as reported during the past two weeks. Jobbers characterize the condition of trade as very fair under the circumstances, although they say that they could handle a great deal more business without severely taxing their facilities. The demand now seems to be of a character which will be steadily maintained, as it rests entirely on the necessities of consumers and merchants. There is no speculation whatever in the buying which is now being done, and the break in freight rates to far Western points is not stimulating the demand from this jobbing center. Staple goods are comparatively quiet, except Barb Wire and Tin Plate, which are moving more freely than most classes of goods. Tin Plate is still scarce and jobbers are regularly advising their traveling men of actual stocks on hand, so that no sales will be made which cannot be immediately filled from stock. Heavy Hardware jobbers report a quiet condition of business with no prospects of an immediate improvement. The Indian warehouse established in this city was the point of much interest yesterday, owing to bids being received and opened for about $1,000,000 worth of supplies, in which are included large quantities of Hardware. Local manufacturers and merchants are very generally bidding.

Notes on Prices.

Wire Nails.—Owing to a variety of influences the Wire Nail market is in a perceptibly stronger position than at our last review, and higher prices are ruling. This is owing in part to the effect of strikes, which have either stopped or diminished the output of some of the mills, with a strong probability that still others will be similarly affected. There is also something of a quickening of the demand, which comes principally from the smaller trade buying in lots of one or two carloads, but at the same time it is understood that some of the large houses are in the market and will probably soon be obliged to replenish their stocks. The condition in the raw material also tends to stiffen the price. Under these conditions quotations for carload lots at mills are now $1 to $1.10, some mills refusing to sell at less than the latter figure. The price from other manufacturers is $1.05, but $1 is still obtainable. The market has a firmer tone, and it would not be surprising if a further advance were made, unless there is an early settlement of the labor difficulties. Small lots from store in New York are still quoted at $1.15 to $1.25.

Advices from Chicago.—The situation has now changed very decidedly in favor of manufacturers. Buyers can no longer dictate prices, but a firm basis has been established, with an advance of at least 10 cents per keg above the low rates prevalent some two weeks since. Factory lots are quoted at close to $1.10 Chicago. The manufacturers are very hopeful of advancing prices a little higher. They are encouraged in this belief by an improvement in the demand during the past week, including inquiries from large buyers who had been supposed to be well stocked. Jobbers quote small lots at $1.15, but report a rather light movement.

Cut Nails.—There has been little change in the Cut Nail market, but the effect of the strikes is perceptible, especially as manufacturers are indisposed to solicit business as eagerly as heretofore or to make concessions to induce orders. The factory price of Western Nails is about 90 cents, but concessions are made from this figure. This, during the past few weeks, had the effect of forcing down somewhat the price of the Eastern manufacturers. The Eastern mills are quoting 95 cents to $1 base for Nails delivered on dock in New York, their quotations for other points being based on a price at from 85 to 90 cents at mill. Small lots from store in New York are held at $1.10 to $1.15.

Advices from Chicago.—A nice run of orders is reported by Cut Nail manufacturers. They are selling for present delivery at the old price of 95 cents, Chicago, for 55 cent average, but will not enter contracts for future delivery, believing that prices will shortly advance on account of the scarcity of coal, as well as the expected restoration of freight rates to the East to their old figure. Small lots from stock are being sold by jobbers at $1.05 to $1.10.

Barb Wire.—The demand for Barb Wire continues fair, and the market is given a somewhat firmer tone in view of the effect of the strikes and the difficulty which is already experienced in operating plants. The advance in raw material also has its influence. On the other hand, trade is naturally diminished in volume and manufacturers are desirous of obtaining such orders as are in reach. Quotations for Four-Point Galvanized are as follows, delivered at the points named: Pittsburgh, $2.05 to $2.15; Cleveland, $2.10 to $2.20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.20 to $2 30.

Advices from Chicago.—The manufacturers of ordinary Barb Wire in this vicinity have not yet entirely caught up with business entered some time since and consequently are firmly maintaining prices. The scarcity of fuel and the advance in Billets they insist will compel them to ask advanced rates on new business. Jobbers are having an excellent demand for Barb Wire from stock, which continues without any relation to the demand for Wire Nails. Quotations for small lots from stock are $2.30 to $2.35, and $2.20 for shipments from factory.

Wire Cloth.—The trade are experiencing something of a scarcity in Screen Wire Cloth, and as a result prices are higher with such manufacturers or jobbers as have a supply on hand.

Apple Parers.—During the coming season Apple Parers will probably sell at prices not materially different from those which ruled last year, but there is an apparent tendency toward somewhat lower figures. The revised quotations of Reading Hardware Company, Reading, Pa., for the season of 1894 are as follows:

	Per doz.
Reading, '72	$3.75
Baldwin	4.25
Advance	4.25
Reading, '78	6 75

Little Giant Steel Truck.—The Little Giant Steel Truck, put on the market by the G. L. Van Namee Mfg. Company, Syracuse, N. Y., is sold to the trade at $24 per dozen, net.

Golden Crown Asparagus and Corn Cooker.—This article is put on the market by the Stuart & Peterson Company, Burlington, N. J., by whom it is sold at $1.40 for the No. 1, $1.60 for the No. 2, and $2 for the No. 3, these prices being subject to a discount of 40 per cent. to the trade.

Fresh Air Inlet and Hitching Post.—Edward M. Stirling, 85 Market street, Newark, N. J., is manufacturing this article, which was illustrated in our issue of April 28. It is sold to the trade at $12, less a discount of 30 per cent.

Frazer Axle Grease.—The following is the price-list of the Frazer Lubricator Company, 83 Murray street, New York, terms net, f.o.b. New York:

	Per gross.
Small wood boxes, gross lots	$9.50
Small wood boxes, half gross lots	10.00
	Per dozen.
Five-pound wood boxes, with bails	$3.25
Ten-pound wood boxes, with bails	6.00
Small tins, with bails	1.37½
Medium tins, with bails	2.75
Large tins, with bails	4.50

Bulk.

	Per pound. Cents.
Wood pails, 15, 25 and 32 pounds	5
Tubs, 36 and 71 pounds	4
Kegs, 112 pounds	3½
Half barrels, 225 to 250 pounds	3½
Barrels, 400 to 475 pounds	3½

Diamond X.

	Per gross.
Small wood boxes	$7.00
Small tins, with bails	14.00

Soldering Coppers and Irons.—In the revised discount sheet of the Covert Mfg. Company, West Troy, N. Y., the following terms are given on Soldering Coppers and Soldering Irons:

			Per cent. discount.
Soldering Coppers			35
Doz.	$3.10	4.30	5.10
Nos.	380	382	384
Doz	7.00	8.20	
Nos.	386	388	
Soldering Irons			35
Doz.	$5.20	6.25	7.50
Nos.	350	352	354
Doz.	9.50	10.75	
Nos.	356	358	

Sheet Zinc.—A revised discount sheet under date May 10 has been issued by Matthiesaen & Hegeler Zinc Company, La Salle, Ill. The base price, $4.50 per 100 pounds, remains unchanged, but revised discounts are announced as follows:

Discounts.	First class. 15 600-pound casks and upward.	Second class. 10 to 14 600-pound casks.	Third class. 5 to 9 600-pound casks.	Fourth class. Under 5 600-pound casks.
	Per cent.	Per cent.	Per cent.	Per cent.
Special	9	9	9	9
Cash with order	3	3	3	3
Quantity	3	2	1	0
Totals	15	14	13	12

Glass.—A more active demand for Window Glass is reported from the West than in the East, local trade showing somewhat of a falling off within the past week or two. Firmer prices, the nearer approach to the time for the annual shut down of factories and the apprehension of a shortage of Glass during the summer months, have caused some factories hitherto idle to start up. Pittsburgh factory quotations are reported as being 85 per cent. discount for single and 85 and 5 per cent. discount for double strength Glass, while manufacturers generally show a disposition to maintain rather than to cut these prices. The discounts given fairly represent the market at large, with possibly concessions in some instances reducing prices to 85 and 5 per cent. discount for single and 85 and 10 per cent. discount for double strength Glass. French Window Glass is still quoted at 70 and 10 per cent. discount. Plate Glass is in somewhat greater demand, with prices ranging from 70 and 5 to 70 and 10 per cent. discount.

Old Metals.—The market for Old Metals is very tame, and dealings are on a narrow scale. The demand for Scrap Iron continues slack, but prices maintain their former level. The following quotations represent dealers' purchasing prices in New York City:

Heavy Copper	℔	lb	7½¢
Light and Tinned Copper	℔	lb	6½¢
Heavy Brass	℔	lb	5½¢
Light Brass	℔	lb	4½¢
Lead	℔	lb	3¢
Tea Lead	℔	lb	2¢
Zinc	℔	lb	2¾¢
No. 1 Pewter	℔	lb	14¢
No. 2 Pewter	℔	lb	7¢
Wrought Scrap Iron, ℔ gross ton	$9.00	@	....
Heavy Cast Scrap, ℔ gross ton	7.00	@	....
Stove Plate Scrap, ℔ gross ton	4.50	@	....
Burnt Iron, ℔ gross ton	3.00	@	3.50

Old Rags, Paper, &c.—The demand for this material has been good and prices remain steady at former quotations, namely:

No. 1 White Rags	℔	lb	3¼ @ 3½¢
No. 2 White Rags	℔	lb	2 @ 2¼¢
Mixed Rags	℔	lb	¾¢
Blues and 3ds	℔	lb	1 @ 1½¢
Hard Sized White Shavings	℔	lb	2¼ @ 2½¢
No. 1 White Book Shavings	℔	lb	1½ @ 1¾¢
No. 2 White Book Shavings	℔	lb	1 @ 1⅛¢
Light Book Shavings	℔	lb	¾¢
No. 1 Mixed Shavings	℔	lb	¾ @ 1¢
No. 2 Mixed Shavings	℔	lb	½ @ ¾¢
No. 1 Printed Books	℔	lb	1 @ 1¼¢
Ordinary Mixed Books	℔	lb	½ @ ¾¢
Newspapers	℔	lb	2-5 @ ½¢
No. 1 Manila Paper	℔	lb	1 @ 1⅛¢
No. 2 Manila Paper	℔	lb	⅝ @ ¾¢
Bogus Paper	℔	lb	½¢
Common Paper	℔	lb	⅜¢
Straw Chips	℔	lb	½¢
Binders' Clippings	℔	lb	½ @ ⅝¢
Jute Butts	℔	lb	1⅞ @ 2 ¢
No. 1 Jute Bagging	℔	lb	1 @ 1¼¢
Mixed Bagging	℔	lb	¾ @ 1 ¢
No. 2 Bagging	℔	lb	½ @ ¾¢
Hemp Twine	℔	lb	2 @ 2¼¢
Manila Rope	℔	lb	2⅛ @ 2¼¢
Jute Rope	℔	lb	1½ @ 1¾¢
Mixed Rope	℔	lb	¾ @ ⅞¢

Old Rubber.—The market for Old Rubber is fairly active, but prices are irregular. The following quotations represent approximately dealers' purchasing rates, New York City delivery:

Car Springs, ton lots, ℔ lb.	....	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb.	....	@	.03½
Rubber shoes, less than carloads, ℔ lb.		@	.03¼
Large Hose, ℔ ton	....	@	12.00
White Wringer Rolls, ℔ lb.	....	@	.03¾
White Syringes, ℔ lb		@	.03¾

Trade Notes.

HESS, SNYDER & Co., Masaillon, Ohio, have just issued a Pump catalogue giving complete and detailed descriptions of their Novelty Force Pumps, which comprise a line suitable for shallow or deep wells, cisterns or for spraying purposes. The catalogue, in addition to the descriptions, with price-lists and tables of sizes, gives illustrations of the Pumps, and at the close attention is directed to Chimney Ventilators.

THE JERSEY CITY GALVANIZING COMPANY have opened a store at 112 John street, opposite Cliff street, New York, where they intend adding a general jobbing business in Plain and Galvanized Sheet Iron, Corrugated and Formed Sheets, Zinc, Spelter and Galvanized Specialties generally, as set forth in their advertisement elsewhere.

LISK MFG. COMPANY, LIMITED, Canandalgua, N. Y., issue circulars to the trade directing their attention to the fact that all of the goods manufactured by the concern are warranted not to rust. Quoting from their circular, they say: "We will make good this guarantee by replacing, free of charge, any articles which may be brought back to you in a rusty condition or prove otherwise defective. Should any such be found our agent will take pleasure in attending to the matter when he makes his next call." The firm also issue a large card notice to this effect, so that dealers may post it up in their stores, and all their customers may see the conditions. The Lisk Mfg. Company also send an official looking document headed "Guarantee," which certifies to the name of the agent for their patent anti-rust tinware and contains a copy of the terms of their guarantee, and is signed with *fac similes* of the autographs of the officers of the company.

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Metal and Miscellaneous Prices.

CHICAGO, MAY 17, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 8.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 lb	@ 5.25
IC, 14x20, 100 lb	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC,10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 -@ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20	$7.00
IX, 10 x 14, 12 x 12, 14 x 20	9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal ,extra. IC, 14 x 20	7.25
Merlon, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.— Bright.

Elwood —IC, 14 x 20	$6.00
IC, 20 x 28	12.50

Roofing Plates.

Palm, IC, 20 x 28	@$11.25
Palm, IX, 20 x 28	@ 14.00
Empire, IC, 20 x 28	@12.00
Empire, IX, 20 x 28	@15.00
Hickory, IC, 20 x 28	@ 12.50
" IX, 20 x 28	@ 15.50
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18 00
Westmoreland :	
IC, 14 x 20	$6.00
IC, 20 x 28	12.00
Elwood :	
IC, 20 x 28	$11 50
Kenwood :	
IC, 20 x 28	$11.50
Furmston :	
IC, 20 x 28	$11.00
Juno :	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method :	
IC, 20 x 28	$17.00
E. L. :	
IC, 20 x 28	$12.50
Jessie :	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resqnared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00
Old Process :	
IC, 14 x 20	9.25
IX, 14 x 20	11.25
IC, 20 x 28	18.50
IX, 20 x 28	22.50
H. B. L., Old Style :	
IC, 14 x 20	7.75
IX, 14 x 20	9 25
IC, 20 x 28	15.50
IX, 20 x 28	18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	lb 2 3-10¢	3 1-10¢
17 to 20	lb 2 4-10¢	3 2-10¢
21 to 24	lb 2 5-10¢	3 3-10¢
25 and 26	lb 2 6-10¢	3 4-10¢
27	lb 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....lb A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis.75@5%

Copper—

Ingot.

Lake.....10½¢ @ 11¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ lb additional.

Brazed Brass Tubing. (100 lb lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.33
Plain, ½ inch up to ⅝ inch	.33
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 lb lots.)

Discount, 40%.

Slab Spelter—

Western Spelter.....4¢

Sheet Zinc—

600 lb casks.....4.50¢
300 lb casks.....4.70¢
Loose sheets.....4.80¢

Lead—

Soft Pig Lead.....4 ¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....13¢
Hallett's.....12¢

Wrought-Iron Pipe—

1¼ and under, Plain	60&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	70&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	62½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles :	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	lb, 2 ¢
" " Brown	lb, 1½¢
" " Purple	lb, 2½¢
" Ground in oil, B. Red	lb, 6½¢
" Ground in oil, Red	lb, 6½¢
" Ground in oil, Brown	lb, 5½¢
" Ground in oil, Purple	lb, 6 ¢
Linseed Oil, Boiled, in bbls	54¢
Linseed Oil, Raw, in bbls	51¢
Mineral Paints	2@4¢
Orange Mineral	9½¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asat'd cans, 8¾¢ ; kegs	7½¢
Sipe's Japan Oil, in bbls, gal	34¢
Spirits Turpentine, in bbls., gal	34½¢
Asphaltum, Trinidad Refined, ton	$45
Tarred Felt, 1 Ply, 100 lb	$1.60
Tarred Felt, 2 Ply, roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, roll of 108 sq. feet	$1.70
Roofing Pitch, bbl. of 300 lb	$3.00

NEW YORK, MAY 18, 1894

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots :
Small lots.....lb, 75¢
100-lb lots.....lb, 73¢
Ton lots.....lb, 70¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting :
Small lots.....lb, 65¢
100-lb lots.....lb, 60¢
Ton lots.....lb, 55¢
No. 2 grade (guaranteed to be over 94% pure Alu minum), cast in ingots for remelting :
Small lots.....lb, 60¢
100-lb lots.....lb, 55¢
Ton lots.....lb, 50¢

Antimony—

Cookson.....lb, 10½¢
Hallett's.....lb, 10 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ft.
¾ in. up to 2 in	$0.35
⅝ in. up to ¾ in	.36
½ in. up to ⅝ in	.38
⅜ in. up to ½ in	.41
5-16 in. up to ⅜ in	.48
¼ in. up to 5-16 in	.65
3-16 in. up to ¼ in	1.00
⅛ in. up to 3-16 in	1.50
Smaller than ⅛ in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 18, inclusive	.28

25 @ 30%

Copper and Bronze Tubing—
8¢ lb more than brass.

Conductors—

Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

*Bottoms, Pits and Flats..*19¢ lb, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10 ¢
Ansonia Grade Casting.....9½¢
Planished......net
Sheet and Bolt.....15¢ lb, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanised.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....85%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20%

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	lb, 2.50	2.80¢
Nos. 17 to 21	lb, 2.60	2.90¢
Nos. 22 to 24	lb, 2.70	3.00¢
Nos. 25 and 26	lb, 2.80	3.10¢
No. 27	lb, 2.90	3.20¢
No. 28	lb, 3.00	3.30¢

American B. B.....lb, 4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....lb, 11¾@12½¢
Patent Planished....lb, A, 10¢; B, 9¢. 5%
Craig Polished Sheet Steel.....lb 8½¢

Galvanized.

	B. L.
Nos. 10 to 16	75@75&5%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....8¾¢@4¢
Bar.....4½¢
Pipe.....5¾¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2¾¢ lb.

Metal Exoanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	16%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil :	
Raw, gal	.. @ .40
Boiled	.. @ .43
Spirits Turpentine :	
In bbls	.. @ .32
Putty :	
In barrels and ¼ bbls	.01¾ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01¾ @ .02¼
In bladders	.01¾ @ .02¼

Roofing Material, &c. :

Asphaltum, Trinidad Refined, ton	$30.00@$35.00
Asphaltum, Rock, ton	$14.00
Coal Tar Felt, 1 Ply, lb	2¢
Coal Tar Felt, 2 Ply, roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, roll 108 sq. ft.	$1.85
Roofing Pitch, bbl.	$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ lb	₩ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....₩ bbl. $1.27@$1.28
Rosin, E. & F.....₩ bbl. $1.40@$1.65
Rosin, G. & H.....₩ bbl. $1.85@$2.15
Rosin, I. & K.....₩ bbl. $2.40@$2 75
Rosin, M. & N.....₩ bbl $2.90@$3.05

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr.....3.50@ 4.25
Peach Bottom, ₩ sqr.....5.00@ 6.25
No. 1 Chapman, ₩ sqr.....4.00@ 4.65
Lehigh Slates, ₩ sqr.....3.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....2.70@ 3.20
Purple, ₩ sqr.....3.50@ 4.50
Unfading Green, ₩ sqr.....3.50@ 4.00
Red, ₩ sqr.....9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ½..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
Kegs, about 55 lb, ₩ lb.....4¢ } 5% dis.
75¢ extra for keg.

Yager's Soldering Salts.
½-lb bottles, each.....30¢
Large quantities, per lb.....40¢

Spelter— 1[illegible]

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Sanca, pigs, ₩ lb..... 21½¢@22¢
Straits, pigs, ₩ lb..... 20½¢@21¢
Straits in bars, ₩ lb.....22¢@22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.50
Atlantic, IC, 14 x 20..... 5.75
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.50
Columbia, IC, 14 x 20..... 7.00
Dane, IC, 14 x 20..... 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... 5.75
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.25
Fort Pitt, IC, 20 x 28 ..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.12½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.25
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Newcastle Real Old Method, IC, 14x20, 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20..... 5.25
Palacio, IC, 14 x 20..... 5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 8.00
Phœnix, IC, 14 x 20..... 5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20..... 5.37½
Vigilant, IC, 14 x 20 ..... 5.50
Waldo Redipped, IC, 14 x 20..... 8.75
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.50
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Iowa, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Redipped, IC, 14x20.....11.00
Merlon, IC, 14x20.. ..... 6.75
Mint, IC, 14x20..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" " IX, 14 x 20..... 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" " IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20 ..... 7.25
Versailles, IC, 14 x 20 ..... 5.75
Youghiogheny, IC, 14 x 20... ... .6.00

Imported Terne Plates—*Charcoal.*

MF Grade, IC, 14 x 20.....$7.50
20 x 28..... 15.00
IX, 14 x 20..... 8.75
20 x 28..... 17 50
Pontymister Grade, IC, 14 x 20.... 6 50
20 x 28.....13.00
IX, 14 x 20. .. 7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20..... 5.75
20 x 28.....11.50
IX, 14 x 20..... 6 75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20.....$5.37½
20 x 28.....10.70
IX, 14 x 20..... 6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20..... 5.25
20 x 28.....10.50
IX, 14 x 20..... 6.40
20 x 28.....12.80

Imported Bright Plates—*Charcoal.*

Duty: 2.2¢ ₩ lb.

Melyn and Calland Grade.	IC, 10 x 14	$6.37½
" "	IC, 12 x 12	6.62½
" "	IC, 14 x 20	6.37½
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.87½
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
" "	DC, 12½ x 17	5.50
" "	DX, 12½ x 17	6.50

Coke.

Steel Coke.—IC, 10x14, 14x20		$5.25@$5.35
	10x20	8.12½
	20x28	11.00
	IX, 10x14, 14x20	6.60
B. V. Grade.—IC, 10x14, 14x20		5.40

Imported Boiler Plates.—

IXX, 14x26..(112 sheets).....$13.35
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz.... 18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.. .....52½&10&5%
1½ and over, Plain ....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 18.2..70&10&5%
Casing, list Nov. 16, 1893..... ....52½%
Inserted Joints Casing, list Nov. 16, 1892..... ....47½%
Steel Boiler Tubes..... 27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 lb casks..... ₩ lb 4¾¢
Per lb.....5¢ @ 5½¢

MANUFACTURING.

Hardware.

It is reported that a reduction in wages varying from 25 to 40 per cent. is to be made in several departments of the Winsted Edge Tool Company, West Winsted, Conn.

The Howe Scale Company, Rutland, Vt., have commenced running on full time.

The capital stock of the Chelsea Wire Fabric Company, Chelsea, Mass., has been increased $10,000 by vote of the directors.

The Wisconsin Iron & Wire Works of Milwaukee, Wis., have been incorporated. The company succeed G. H. Norris in the ownership of the Reliance Wire Works, which Mr. Norris recently purchased from D. D. Williams. The capital stock of the new company is $30,000, and the incorporators are G. H. Norris, J. G. Beckley and J. H. Gilmau. Mr. Norris is president of the company, Mr. Beckley vice-president, and Mr. Gilman secretary and treasurer.

Burgess Soldering Furnace Company, Columbus, Ohio, advise us that business for the past three months has been very good, and they refer hopefully to the outlook for the future.

D. M. Steward Mfg. Company, Chattanooga, Tenn., report the demand for goods in their line as fairly good, orders, while smaller than usual, being more numerous. They state that they are constantly adding to their customers in crayons and pencils, and that orders keep coming in at such a rate as to preclude the possibility of getting a stock ahead, the company being sometimes three or four weeks behind orders.

E. Blair, Bucyrus, Ohio, advises us that he has sold 50 per cent. more swine jewelry during the first four months of 1894 than he did during the same period last year. Mr. Blair is making arrangements for the manufacture of another line of hog ringers.

A. J. Phillips & Co., Fenton, Mich., advise us that their sales of screen doors thus far this year are largely in excess of their total shipment last year. Their factory was in operation all through the fall and winter with a full force and on full time and pay, in anticipation that when the season had arrived there would be the usual shortage in screen goods, and perhaps more of a shortage than in former years. They state that screen goods are coming to be considered as staple articles and as almost of necessities, if the sales during this, an off year, count for anything, nearly all of the leading factories on screen doors being busy. A notable feature of the market this season is that screen doors of the better grades have been increasingly ordered, an unusually large number of fancy pattern screen doors having been devised. The running of their factory during the fall and winter has enabled the firm to accumulate a very nice stock and assortment of window screens and screen frames, and they think that their capacity will enable them to keep their assortment good until the end of the season.

Standard Company, 57 Haverhill street, Boston, have enlarged and improved their well-known Dover egg beater, confident that its sale will be thereby increased.

Plumb, Burdict & Barnard, Buffalo, N. Y., having outgrown the plant they now occupy, have commenced work on their new factory at North Tonawanda. They hope to have the new works completed by the coming fall. The new plant will be operated by electric power.

John Sommer's Son, Newark N. J., refers to the favor with which his Boss lemon squeezers are received by the trade. These squeezers are described as made out of hard sugar maple, finely finished, with strong nickel plated hinges, overlapping ends and large smoothly polished lignum vitæ bowl. The cleanliness, durability and cheapness of these lemon squeezers are points which are made in regard to them by the manufacturer.

Levin Pruner Company, 37 Dey street, New York, advise us that their pruner has made its way into almost every country on the globe and that it has apparently come to stay.

Wabash Screen Door Company, Rhinelander, Wis., are having a much better business than they had any reason to hope for considering the times. They advise us that they are at this time fully up to last season's trade, and if business continues throughout the next sixty days, as the prospects now indicate, they will sell a larger number of screen doors this year than ever before, the company estimating their output at over 325,000 doors. They state that the greatest surprise in this season's business is the increased demand for fancy doors or doors of better quality. Up to the present time they have shipped more fancy doors than they did during the whole of last season.

Buck Bros., Millbury, Mass., have received a letter from Geo. S. Waite, superintendent of the Toledo Manual Training School, Toledo, Ohio, in which reference is made to the satisfaction which has resulted from the use of their tools in the school work. During the past eight years the school has purchased from Buck Bros. 100 sets of carving tools, 144 sets of carpenters' chisels and 72 sets of wood turning chisels. Some of these tools have been in use for the whole of that period and are referred to as having given splendid service.

Miscellaneous.

The Pittsburgh Crushed Steel Company, Limited, patentees and sole manufacturers of steel emery and crushed steel, have recently completed the erection of an addition to their plant 60 x 100 feet in size.

At a meeting of the board of directors of the Daniels Steel Railroad Tie Company, held in Youngstown, Ohio, on May 5, the resignation of Mr. Daniels as chairman of the concern was presented and accepted and Thomp Burton was elected to succeed him and is now holding the dual position of president and general manager. Hon L. C. Ohl was added to the board of directors and was elected vice president of the concern.

The Appleton Mfg. Company of Appleton, Wis., have begun the work of removing their implement factory to Geneva, Ill.

THE METAL WORKER.

NEW YORK AND CHICAGO.

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ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Building Restrictions.

The past few years have witnessed great advances in the enactment of laws designed to so control the erection of buildings as to render them in every way safe for the occupants. Scarcely a city of any size can now be found that does not possess a code of building laws, while sizes of timbers, thicknesses of walls, provisions for escape in case of fire, as well as precautions to prevent fire itself, are all to be in accordance with the said laws. In the larger cities competent inspectors have laid upon them the duty of enforcing the laws, and, as a rule, in a somewhat less efficient manner, the matter receives attention in smaller municipalities. Of most interest to our readers is the subject of heating in its relation to legal protection against fire. Much of the good legislation in this line has been at the instigation or through the co-operation of the fire underwriters. They are certainly in a position to accurately judge of the practical efficiency of any arrangements that may be legalized, but too frequently their good judgment has been outweighed by exigencies of politics. Thus many laws of this character bear the marks of the influence, politically applied, to make the restrictions agreeable to persons who look only for the cheapest but not the best way in all things.

Diversity in Building Laws.

As a consequence there exists to-day a surprising diversity in the laws relating to the installation of heating systems. It is obvious that only one of them all can be exactly right, and yet the variety is to a certain extent excusable when we consider that in many cases the law makes the arrangement more than safe enough, and hence differs from those which approach nearer the danger line. Nowhere is this more noticeable than in the matter of permissible distances between heating pipes and adjacent wood work. Even a superficial inspection of the building laws relating to hot air pipes in some of the principal cities of the country will serve to clearly show this wide diversity. Thus, in Boston the law reads that all hot air pipes shall be 1 inch from the wood. The same holds true with steam pipes, and this distance must be maintained with either hot air or steam pipes unless the wood work is protected by metal casing or by stone or earthen ring. The laws in Providence and St. Louis are substantially the same. In Chicago, however, we find the other extreme. Here the hot air conductors, if placed within 10 inches of the wood work, must be made double, with at least ½ inch air space between the two. Steam pipes, on the other hand, need be kept only 2 inches from wood unless protected. Chicago, like many other cities, very exclusively dictates the material to be used in the construction of its pipes—in this case IC or IX bright tin. Under the law, literally followed, galvanized iron cannot be used. Of course it is, however, and the crudeness of the law thereby illustrated. The Cleveland restrictions are nearly the same, except that the steam pipe distance is increased to 6 inches, and the Milwaukee law is identical with regard to hot air pipes. Memphis has an elaborate series of restrictions. It dictates that all brick or stone hot air shafts shall be lined with tin pipes, something very desirable, it must be admitted, but entirely unnecessary, as a matter of fire protection, under all ordinary conditions. Elaborate arrangements are required in the case of all flues; thus it is necessary, under the law, that all metal flues or pipes for the conduction of heated air shall be inclosed with 4 inches thickness of hard incombustible material, except in the case of horizontal pipes, which must be double, the inner one 3 inches from the stud, with ½-inch air space between itself and the water pipe. In addition, the inside faces of the exposed stud must be well lined with tin plate and the outside with iron lath or slats. Horizontal hot air pipes must furthermore be kept 6 inches below floors or ceilings if they are unprotected, or 3 inches if protected by a metal shield. Hot air pipes passing through partitions must have 4 inches of brick insulation or else a double collar of metal with 2 inch air space and holes for ventilation. Steam pipes may be placed within 2 inches of wood work, or within 1 inch if protected by metal shield. New York City has a code of regulations practically identical with that of Memphis. Cincinnati makes the required distance of steam and hot air pipes 6 inches from unprotected combustive material, but makes all arrangements subject to approval of inspector. Detroit limits the distance to 3 inches. Denver requires metal flues to be double or wrapped in incombustible materials if not placed in stone or brick walls. San Francisco has a similar law, which specifies that the double pipe shall have ½ inch space filled with fire proof material.

Opportunity for Revision.

Many more examples might be given, but enough has been shown to indicate that there are either most reckless risks taken under some of the laws, or else the safeguards prescribed in others are practically unnecessary. Notwithstanding the numerous experiments that have been made, it is still an open question just how far removed wood work must be from steam and hot air pipes to avoid danger by fire. Of course, this uncertainty is largely due to the conditions under which the pipes are installed and the system is operated, and a distance that is safe where there is ample ventilation around the pipe may become dangerous when the pipe passes through a partition and opportunity is given to overheat both air and wood work. It would seem that the most practical method of revising existing laws which have proved unsuitable would be to carefully and exhaustively study the laws of other municipalities in connection with the reports of the fires occurring within their limits. The inspectors, the fire department and the underwriters are all supposed to express, when possible, their knowledge or belief in the cause of a fire, and the extended examination of such reports must serve to show the adequacy of existing laws. In connection with the celebrated trial of the Chicago Anarchists, the judge gave us in a single sentence the spirit that should rule in all law making: "The law is common sense." Most truly is common sense called on to establish the perfect and comprehensive building laws that are necessary in every community to protect its citizens, so far as may be possible, from all danger through improper construction of their dwellings, their factories, and their places of amusement, instruction and worship.

A Boston Trade School.

In another column will be found some details in regard to one of the latest additions to the trade school movement in the United States, the plumbing school started in January last in connection with the North End Union of the city of Boston. The success of this school during its brief existence indorses the conviction, so often expressed by advocates of the trade school system generally, that the establishment of such vehicles of definite trade instruction is loudly called for

by the classes for whose benefit they are designed. Every opportunity of the kind that has been offered to American boys has been eagerly seized upon, and the number of applicants for instruction has usually—as in this case—far exceeded the available accommodation. This has been the history of the plumbing classes, at least, in New York, Brooklyn, Philadelphia, and other cities where trade schools are in operation, and it is not surprising that the Boston school should have had the same experience. If the resolution of the trustees of the Franklin legacy to establish therewith, in Boston, a trade school of noble proportions is firmly adhered to, the city will receive a still wider benefit in this line.

Leaders in Steam Heating.

It was not so long ago that information on hot water heating was sought altogether from England, because this method of heating, in one way and another, had been in use there for a number of years. With the more convenient fittiugs made in the United States and the use of wrought iron pipe, however, rapid advance was made in the work, and less dependence was placed upon the teachings of English practice. In steam heating the case is just reversed, and engineers of foreign countries seek information in the United States with the same interest and confidence with which they themselves were formerly consulted respecting hot water. Architects in England, France, Germany, Russia and the Scandiuavian Peninsula have sent plans of projected buildings to leading engineers in this country for instruction as to the method of heating by steam. These plans have been returned with a description of the necessary plant and full explanation of the rules used in calculating the surface required on the heat unit basis, and drawings have been furnished showing the method of installing the plants from the heating apparatus to the smallest detail of the piping. In a number of instances the heating apparatus, pipes and fittings, with valves and radiators, have been shipped abroad, each part being marked and described so that the plant could be erected entirely by foreign labor.

In consequence of the recent discovery of frauds in the Boston Custom House, Secretary Carlisle has issued an order to the special Treasury agents directing them to examine every bonded warehouse in the country. The agents in New York City have already begun their inspection, which it is estimated, will occupy one year at least, as there are some 70 to be gone through.

Last week was a sad one for the fire insurance companies in the East. Beginning with the destruction of the Brooklyn Tabernacle and the adjoining hotel on Sunday, May 13, almost every day scored records of large and destructive fires in New York, Boston, Brooklyn and Philadelphia.

Institute of Building Arts.

The Institute of Building Arts is a permanent exhibition of building materials and improvements, and is owned and conducted by the Illinois Chapter of the American Institute of Architects at 63 to 69 Washington street, Chicago. The institute was established for the purpose of centralizing information relating to building, and congregating in permanent exposition all materials, appliances or inventions of a practical or ornamental character. The building is free to the visiting public, who are welcome to all its advantages and information and to the inspection of the numerous exhibits it contains. It embraces a library of architectural works, including files of all architectural and building journals, and contains assembly rooms for the meetings of all associations connected with architecture and the building arts.

The Illinois Chapter of the American Institute of Architects will hold their first annual special building trades and material exhibition at the Institute of Building Arts, from May 15 to June 2, 1894, inclusive. It will be known as the Chicago Building Trades and Material Exhibition, and will be held in the new permanent addition to the institute, which now comprises the larger part of the second floor of Nos. 67 and 69 Washington street, besides the whole of the second floor of Nos. 63 and 65. The exhibition will be supplementary to the permanent exhibit of the Institute of Building Arts, which has been in existence for many years. The privilege of exhibition is given not only to manufacturers, manufacturers' agents or contractors, or the proprietors of any building material, but the artisans, mechanics, decorative artists, wrought iron workers and carvers who may desire to show specimens of their mechanical or artistic skill. Among the permanent and special exhibitors at the institute can be mentioned the following :

Boiler Attachments.—Reliance Gauge Company, Cleveland, Ohio.

Blinds.—Willer Mfg. Company, Milwaukee, S. A. Bradley, manager, 183 and 185 Dearborn street, Chicago.

Engines.—New York Safety Steam Power Company, 56 to 60 South Canal street, Chicago.

Elevator Guards, Railings, &c. — Northwestern Expanded Metal Company, Twenty-sixth street and Stewart avenue, Chicago.

Fire Proof Construction.—Bostwick Steel Lath Company, Niles, Ohio, W. G. Hurlburt, secretary, 161 La Salle street, Chicago; Guastivino Fire Proof Construction Company, 1300 Auditorium, Chicago; Mackolite Fire Proofing Company, 824 Schiller Building, Chicago; Northwestern Expanded Metal Company, Twenty-sixth street and Stewart avenue, Chicago; John A. Roebling's Sons Company, 171 and 173 Lake street, Chicago ; T. O'Shae, 80 Twenty-fifth place, Chicago.

Fire Proof Lath.—Bostwick Steel Lath Company, Niles, Ohio, W. G. Hurlburt, secretary, 161 La Salle street, Chicago; Northwestern Expanded Metal Company, Twenty-sixth street and Stewart avenue, Chicago; John A. Roebling's Sons Company, 171 and 173 Lake street, Chicago.

Gas Ranges —George M. Clark & Co., 135 to 161 Superior street, Chicago; Mason & Davis Company, 72 Lake street, Chicago; Milwaukee Gas Stove Company, Milwaukee, Wis.; Schneider & Trenkamp Company, Cleveland, Ohio, H. R. Hamilton, agent, 67 and 69 Lake street, Chicago.

Hardware Specialties. — Cannon & Gibbs, 397 W. Lake street, Chicago; Duplex Hanger Company, 584 Pearl street, Cleveland, Ohio; F. S. Hutchinson Company, West avenue and Sixth street, Long Island City, N. Y.; Lane Bros., Poughkeepsie, N. Y.; M. B. Swezey, 120 Twentieth street, Chicago; Reading Hardware Company, 73 Wabash avenue, Chicago.

Heating Appliances.—F. Farquhar & Sons, Blue Island, Ill.; W. H. Page Boiler Company, Norwich, Conn.; S. Wilks Mfg. Company, 113 to 123 Clinton street, Chicago.

Pipe Covering and Insulation.—A. C. Kemper, 208 and 210 Lake street, Chicago; H. W. Johns Mfg. Company, 242 Randolph street, Chicago; Western Mineral Wool Company, 437 Rookery, Chicago.

Plumbing Specialties —Alberene Stone Company, 219 Dearborn street, Chicago; B. P. Bower & Co., 41 Academy street, Cleveland, Ohio ; Wm. S. Cooper Brass Works, 442 North Thirteenth street, Philadelphia, and 219 Dearborn street, Chicago; Detroit Sanitary Supply Company, 37 First street, Detroit, Mich.; Du Bois Mfg. Company, 245 Ninth avenue, New York; G. C. Geraty, 307 East Fifty-fourth street, Chicago; Adams & Westlake Company, 110 Ontario street, Chicago; J. C. Hartford & Co., 57 Dearborn street, Chicago; L. Wolff Mfg. Company, 91 Dearborn street and 93 West Lake street, Chicago; P. H. Gunderman, 889 North Halsted street, Chicago; Thos. Kelly & Bros., 124 Franklin street, Chicago; Norton Bros., Masonic Temple, Chicago; Sanitas Mfg. Company, 217 Lake street, Chicago; Steel Bath Mfg. Company, Detroit, Mich.; J. J. Wade & Son, 276 Dearborn street, Chicago.

Pumps. — Erwin - Welch Hydraulic Machinery Company, 51 South Canal street, Chicago ; U. G. Reynolds, Chicago.

Registers and Ventilators.—Tuttle & Bailey Mfg. Company, 136 Lake street, Chicago.

Screens.—E. T. Burrowes & Co., Portland, Maine ; H. B. Dodge & Co., 65 Washington street, Chicago ; Willer Mfg. Company, Milwaukee, Wis., S. A. Bradley, manager, 183 and 185 Dearborn street, Chicago.

Sewer Specialties.—James Barrett, 193 Tremont street, Boston, Mass.; E. J. Flanedy, 168 South Peoria street, Chicago.

Steel Ceiling.—Fred. F. Bischoff & Co., 24 to 26 West Lake street, Chicago.

Valves —Chapman Valve Mfg. Company, 24 West Lake street, Chicago; Jenkins Bros., 31 North Canal street, Chicago.

Window Improvements. — Gardner Sash Balance Company, First National Bank Building, Chicago; Howarth Reversible Sash & Sash Center Company, 112 and 114 Antoine street, Detroit, Mich.; McDonough Mfg. Company, Eu Claire, Wis.

Wood Carving.—Gustave Behm, 641 Larrabee street, Chicago.

The Illinois Chapter of the American Institute of Architects informally opened their new library and assembly rooms, Monday evening, May 14, in connection with the first annual exhibition of the building trades and materials. There were in attendance the most prominent architects of Chicago, builders and exhibitors. Special medals of silver are to be made after designs furnished by George Beaumont, and these are to be awarded to such exhibitors as may be deemed entitled to them by a jury of experts to be appointed.

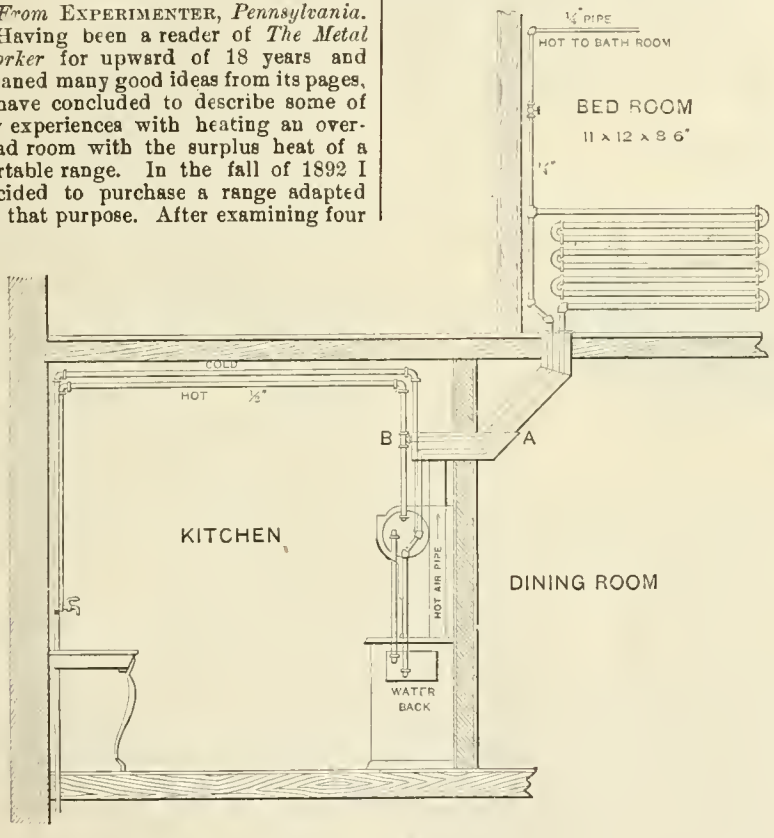
THE LETTER BOX.

Machine or Tool.

From F. A. R., *Brooklyn.*—In reply to the inquiry of "M. J. C.," Elwood, Ind., which appears in *The Metal Worker* of May 12, I consider the term "machine tool" a very wrong name for a lathe. A lathe is as truly a machine as is the brake or stamping machine. Machine tools are tools placed within a lathe, brake or press to perform on whatever work is placed in the machine. If lathes be called tools, what will you call the numerous appliances that do the work placed in a lathe?

Utilizing Surplus Heat.

From EXPERIMENTER, *Pennsylvania.*—Having been a reader of *The Metal Worker* for upward of 18 years and gleaned many good ideas from its pages, I have concluded to describe some of my experiences with heating an overhead room with the surplus heat of a portable range. In the fall of 1892 I decided to purchase a range adapted for that purpose. After examining four different makes, I found it rather difficult to decide which one to select as the most efficient and economical, but finally selected a No. 80 Fidelity range, because the hot air outlet was somewhat larger than that of the others, also because the hot air attachment was an independent feature, placed on the end of a complete range, so that it could not possibly chill the oven, which, it is claimed, is the case with some heating ranges. After placing the range in position and connecting the hot and cold water pipes, I cut a hole through the partition and floor, putting in a 5 x 8¾ inch square pipe, to which I connected the 3½ x 8½ inch oval hot air pipe from range. At A on the sketch a hinged cover (not shown in detail) was placed, which when closed threw the heat upstairs. On opening this cover and closing the damper in square pipe, the hot air was thrown into the dining room. The result was quite gratifying. As the family did not use much hot water and the fire was kept burning briskly at all times, the water in the boiler boiled and at times generated steam. The thought suggested itself that a coil could be placed up stairs, and by leaving the door to back room open assist in keeping it warm. After some search a second hand coil, consisting of 40 feet of 1-inch pipe, was secured. This was rather more pipe than was requisite, but being averse to spending any time on alterations I concluded to risk it. The coil was placed in position and a tee was placed on the cold water pipe from the boiler to the water back, and a pipe with two 45° ells carried high enough to clear the other pipes, thence up through hot air pipe and connected with bottom pipe of coil, which made the return pipe. At B another tee was inserted and carried up alongside of return pipe to top of coil, and connected with a reducer tee to coil. Here a ¼-inch pipe was attached and extended to bathtub, primarily as an air vent, but later developed into a luxury, as a tubful of hot water could be drawn in 15 minutes. On flow and return pipes globe valves were placed to cut off circulation when desired. From the accompanying plan it appears as though the connections were direct; such is, however, not the case. The coil stands parallel with the partition and was drawn thus to obviate the necessity of making another view, and there are eight angles and ells on both flow and return pipes. The result exceeded expectations as far as heating the two rooms was concerned, but in a family where considerable hot water is used it would not prove quite so satisfactory. A coil consisting of the same number of feet of ¾-inch pipe would have been a perfect job. I trust this experiment will be of some service to a brother chip.



Utilizing Surplus Heat.

Fire Place Smokes.

From THE MILLER GRATE COMPANY, *Cleveland, Ohio.*—We notice in *The Metal Worker* of May 12 a communication from "J. A. S," Fairfield, Iowa, in regard to a fire place which smokes. If "J. A. S." will fill the hollow space of back and side to top of lower damper we think he will find the remedy for his smoking fire place.

Open or Closed Soil Pipes?

From M. C H., *Portland, Maine.*—I should like to have the opinions of the readers of *The Metal Worker* on covering soil pipe after it passes through the roof. Should the end be left open or covered with a wire basket or ventilator cap or cowl? It is my opinion that in this section all such devices would be stopped by a sleet storm and frozen up, effectually preventing vetilation. I have not seen any trouble where the end had been left entirely open.

Note.—The regulations in the city of New York require the end of the soil pipe to be protected by a screen. We suppose that the same practice is followed in other cities. It has been said that the open end of a soil pipe has been stopped by birds building nests in it. We shall be glad to have our readers give their opinions.

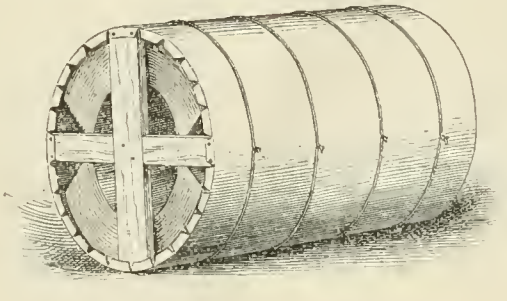
Sorting Information.

From N. G., *Tacoma, Wash.*—Having seen the letter of "C. E. S." in *The Metal Worker* of May 12, I send you my method of sorting information. In our shop all kinds of work is done, roofing, plumbing, steam and hot water heating and furnace work, consequently we need information on all sorts of subjects. I have made it a custom to clip the articles from *The Metal Worker* that are of practical value in our trade, and in order to have all of the clippings referring to one subject in one place I use large envelopes and have them labeled "Kitchen Boilers," "Plumbing," "Roofing," "Steam and Hot Water," "Pumps," "Plumbing Laws," "Furnace Work," "Pattern Cutting," "Tinner," "Gas and Gasfitter," "Stoves," "Chimneys" and "Electricity." After I have read the paper I cut out such articles as have interest to me or which I think will be of future benefit to me on any one of these subjects, and put them in the proper envelope. Then when I want to get some information on pumps or roofing I get the envelopes bearing these titles, and without the labor of searching through a number of

papers to get the right one, I have all the information before me. Each article clipped bears the date of the paper in which it appeared in red ink. I pursue the same course with advertisements and have accumulated an excellent business directory and a valuable collection of illustrations of articles that it would be impossible for any dealer to carry but which are often inquired for.

Proposed Package for Tin Plate.

From A. L. BURTIS, *Lockport, N. Y.*—Has any manufacturer or user of roofing tin any suggestions to offer for an improved package for shipping the plates? The last invoice of 20 x 28 came to hand all broken up, and almost always comes more or less dilapidated. Any one who has ever handled a quantity of it knows it to be a tough job and one to be dreaded. The boxes go by the name of "Bibles" on account of being something to swear by. Why cannot a cylindrical form of package be adopted in which two boxes of 20 x 28 could be packed and rolled about like a barrel? The cylinder may be of sheet iron, and could be used by the tinner for many purposes and might be charged for. We all know that it is a benefit to sheets of tin to be formed, and much of it is so treated to make it smooth. Although taking up a little more space as freight, I think the railroads would not charge much higher rates per hundred. The sketch that I inclose shows a form of package. It is merely a cylinder of sheet iron wrapped around with wire and the ends bent down, the tin plates being bent in half cylinders, leaving a hollow core. Across both ends of the package are strips of wood so placed as to prevent the sheets from slipping out. Very likely one strip would be sufficient, for I do not think the plates would have much tendency to slide out if closely packed. I would like to hear the opinions of readers of *The Metal Worker* on this system of packing tin plates, and would also be glad if some of the American manufacturers would give their ideas.



Proposed Package for Tin Plate.

Wants a Better System.

From A READER, *Brooklyn.*—For the benefit of "W. S. G.," whose inquiry appeared in *The Metal Worker* of May 12, I give my idea of church heating. The hot air should be distributed and discharged into the church from a number of registers placed in the side walls at an elevation on a level with the eaves of the building. Ventilation for the building should be secured by air being drawn into registers placed at the base of the side walls. The capacity of the ventilating registers should be one-half that of the hot air registers. I should be glad to have the readers of *The Metal Worker* give their views upon this idea, as I consider that placing both the heating and ventilating registers on the floor, as shown on the diagram, is virtually connecting them together.

Paper Backed Corrugated Iron.

From CASWELL & MOORE *Phœnixville, N. Y.*—Will some reader of *The Metal Worker* inform us whether any parties now manufacture corrugated iron with a covering of thick paper attached to it on the under side, and if so, where the material can be obtained? A sample was sent us several years ago, but has been mislaid or lost. The paper was pressed into the corrugations and adhered very firmly to the iron. We suppose the lining was for the purpose of preventing condensation or sweating.

By the reduction of the price of city made gas in Philadelphia from $1.50 to $1 per 1000 cubic feet, the receipts for the first four months of this year show a loss of revenue, as compared with the same period of 1893, amounting to $338,004. It is estimated that the city gas bureau realized a profit of $1,000,000 last year, but if the present ratio of consumption keeps up a deficit of about $190,000 will be exhibited at the end of 1894. The report of the chief of the Gas Bureau shows that although the price of gas was reduced 33⅓ per cent., consumption has only increased 18 per cent. This estimate, however, does not take into consideration the fact that the lower price will ultimately stimulate consumption much more. It is not reasonable to look for an immediate increase of any vast proportion, for only gradually will householders use gas more freely. The advantages of gas for heating and cooking will be admitted and the employment of gas stoves and ranges is sure to follow as soon as the price of the fuel renders their use economical.

Coxey's "popular" movement has come to an ignominious period by the consignment of the Commonweal leader and his principal lieutenants to jail in Washington on conviction of the offenses of displaying unlawful banners in the Capitol grounds and trampling on the grass. The whole episode has attracted far more attention than it merited.

The bill, promoted by the New York Academy of Medicine, providing for the establishment of a National Health Bureau has been favorably reported to the House by the Committee on Interstate and Foreign Commerce, and the measure has a good prospect of being passed into law by the present Congress.

A Canadian on American Tin Plate.

The *Canadian Manufacturer* of Toronto prints the following:

A few weeks ago the manager of a Toronto manufacturing concern, who are, perhaps, the largest consumers in Canada of tin plates, expressed a wish to have an opportunity of examining and testing some of the finer qualities of American tin plates. The gentleman to whom this wish was expressed happened to be a personal friend of one of the officers of the New Castle Steel & Tin Plate Company, who are proprietors of extensive tin plate works at New Castle, Pa., and in this way the wish of the Canadian consumer was made known to the American manufacturer. It was then that the New Castle Steel & Tin Plate Company addressed a letter to the Kemp Mfg. Company, Toronto, in which it was stated: "We have this day sent you a box of mixed plates—some ordinary coke, some sheets of a better grade of coke, and some of common charcoal. We would be pleased to have you inspect these plates and submit them to any test that you may require in your work. These are genuine American plates, made from Lake Superior ores, through our blast furnace, steel plant, and finished throughout in our works. We are furnishing these plates to some of the largest consumers in the United States, and thus far they seem to give the best satisfaction, as we have received nothing but praise in regard to the coating and working properties of the steel. . . . We make both a pure palm oil plate and a patent plate. The charcoal plates sent you are a pure palm oil finished plate. The cokes are made on patent machines. We are anxious to have you try our plates, and if at any time you desire high grade plates we would be pleased to quote you prices."

The writer was afforded an opportunity to inspect these American plates and was impressed with the most favorable comparison they bore to similar Welsh plates; and we have been informed by the Kemp Mfg. Company that they have been subjected to precisely the same processes of manufacture in their works as all other plates are, and that they are the equal in all respects of any plates ever used in that factory.

The Technical Education Board of the London County Council, England, are arranging a series of conferences during the coming summer between representatives of the various London industries. The object the board have in view is to elicit from practical artisans useful information as to what kind of trade education is required in each case, in what respects the existing provision is faulty, how it can be improved, and the best steps that can be taken to bring it to the notice of the younger workmen and apprentices.

The woolen carpet which has covered the coiners' room in the San Francisco mint for several years was recently cremated. On refining the ashes the Government recovered 279 ounces of gold, worth $5500.

The Chicago Stamping Company.

Recent additions have been made to the plant of the Chicago Stamping Company, rendering it a very much more complete establishment in every department. The works are now so extensive that they rank among the largest of the kind in the country. They occupy almost an entire city block, bounded by Congress, Green, Harrison and Peoria streets in the west division of the city of Chicago. This is graphically shown by reference to the accompanying diagram giving a ground plan of the works. The only portion of the block not included in the company's plant is the northwest corner.

These works were established by Frank Sturges & Co. in 1865. That firm erected a three-story building 100 by 30 feet on a portion of the present site. From this comparatively small beginning has gradually grown the important enterprise which is the subject of this article. The incorporation of the company dates from 1876. Frank Sturges, the founder of the company, still retains his connection with it, and is at present one of the board of directors. His son, Lee Sturges, became connected with the establishment in February, 1886, and is now president. Under his management the progress of the company has received increased impetus, judicious alterations have been made in the plant and its scope has been very greatly enlarged. W. M. Conger, now vice president and secretary, was the late owner of the Newark Tea Tray Company of Newark, N. J., and first made the manufacture of high grade tea trays a success in this country. He was also the first inventor of machinery for successfully manufacturing stove boards.

The buildings erected on the block above referred to vary in hight from one to four stories. The main building of the factory is at Harrison and Peoria streets and is four stories high. The store building is diagonally opposite, on the corner of Congress and Green streets, and consists of four stories and a basement. The tin shops, stables, machine shops, stamping rooms, &c., occupy the intervening ground and are of irregular hight.

Until last year the company maintained a store on Lake street in the heart of the business section of Chicago, but at that time their new store building was finished and the offices were then removed to and consolidated with the works, greatly improving the shipping facilities, avoiding the frequent handling of goods, and enabling orders to be filled with much greater promptness.

The works may be said to be divided into two grand departments, of which one is devoted to house furnishing goods and the other to specialties, such as cans, grocers' goods, milk cans, milk can trimmings and stock.

The company manufacture their own raw material as far as possible. They have their own tin plate plant, in which they produce a large proportion of the tin plates required for their consumption. This department was started about the beginning of the present year, and now has three automatic tinning machines, to which more will soon be added. Contracts have already been placed for the additional machines, some of which are intended for tinning very large and heavy plates for milk cans. The capacity of the machines now in operation is from 800 to 1000 boxes per week. It is the intention of the company ultimately to not only make all the tin plates required for their own consumption, but also to manufacture for the open market. At present black plates are purchased from outside manufacturers, but the erection of a rolling mill at some convenient point is contemplated, and it would probably have been begun before this time if the question of tariff duties had been favorably settled.

The stamping department contains one of the largest presses in the world. Thus far only two of these large presses have been built. It is of the Stiles & Parker make, takes a 5-foot blank, weighs 65 tons and stands 18 feet high from the floor. It is used for very heavy work, pressing sheets up to the heaviest gauges. Other large drawing presses are in this department, which are used for dish pans and large work, together with a great number of small presses for cutting up tin plates for small ware and drawing all descriptions of small articles and miscellaneous work.

A peculiar feature of this establishment is that all the metal cutting for the works is done in one place, the stock then being distributed to the different departments in which it is finally worked up. In this way the cutting is economically done, insuring a minimum waste of tin plate. The importance of this feature will be realized when it is known that between 3000 and 4000 different articles are constantly in process of manufacture. The machine shop for making all the dies and special machinery is equipped with the latest kinds of planers, drills, lathes, &c. It is a complete die and tool shop, but is run exclusively on the company's own work.

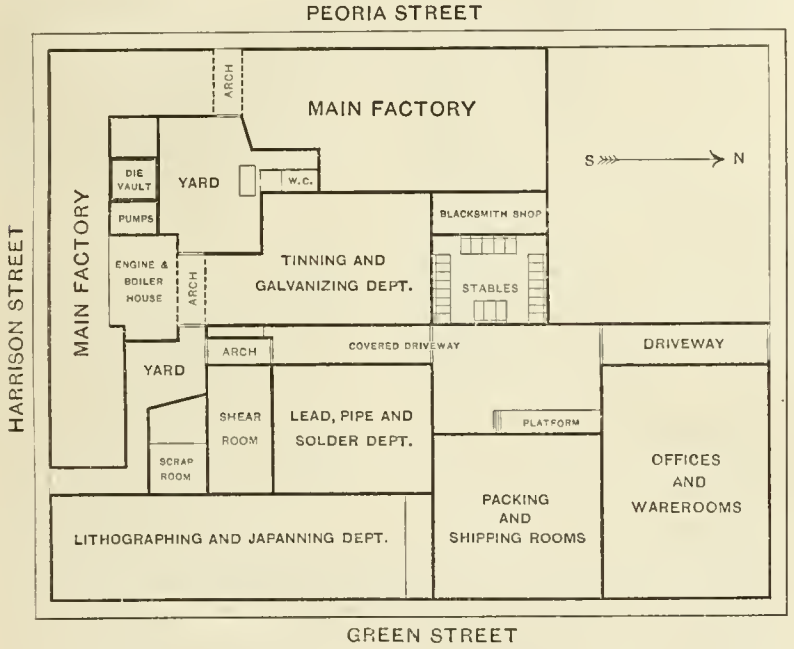
This concern was one of the first in the country to make stamped milk cans, and are now very prominent in the manufacture of milk cans and dairy supplies. They make a very great variety of milk cans, as each section of the country has its own peculiar pattern, and the company's business extends over the entire area. This department, which is under the management of W. H. Burn, formerly secretary of the Buhl Stamping Company of Detroit, is an important branch of the establishment, and is located on the ground floor of the main factory. Here milk cans are manufactured in large quantities for stock, so that the demand for made up cans can be promptly supplied. A large force of hands is also regularly employed in making up trimmings to supply the demand for this class of work.

The second, third and fourth floors of the main factory building are devoted to pieced tinware and can work, such as paint cans and miscellaneous tinware. The tinners' department for sheet iron and galvanized iron work and heavy tin work is also in this part of the establishment.

All stamped ware is retinned in a retinning shop operated in close connection with the tin plate department. It contains a number of stacks, additions to which are being made which will considerably increase its facilities. Retinning requires peculiar skill on the part of the workmen, and consequently the highest priced labor is found in this shop. An important department of the works is the galvanizing shop, which is also operated in connection with the tinning house. Galvanized ware, such as coal hods, buckets, &c., is first made of black iron and is galvanized afterward.

A special department is devoted to the manufacture of lead pipe and solder. It is equipped with the necessary machinery for manufacturing all sizes of lead pipe, from 4 inch down to ¼ inch. Here large quantities of solder are also made for the general trade. It is the intention to make the manufacture of lead pipe and solder more conspicuous hereafter.

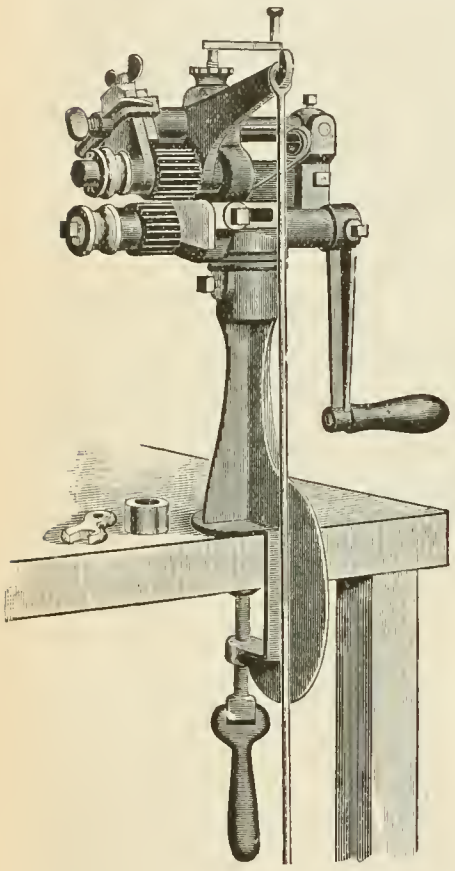
An extensive shop has been fitted up for lithographing tinware and japanned ware, including not only staple articles known to the trade, but a large amount of specialties, such as advertising signs, druggists' boxes, tea caddies, &c. Three power presses are constantly in operation on lithographic work. In close connection with the printing department is the japanning department, in which are a number of large baking ovens heated by steam. The company also have a nickel plating plant, in which they nickel plate all portions of their product requiring such treatment.



PLAN OF THE WORKS OF THE CHICAGO STAMPING COMPANY.

The line of house furnishing goods manufactured by the Chicago Stamping Company covers everything made by establishments of this kind. In addition, they turn out any kind of special work in sheet metal ware; for instance, they have an important trade in agricultural implement seats made of stamped metal, which are being used in place of the old style heavy cast iron seats. The special boxes made for the use of druggists and others are of infinite variety and sizes, some having been turned out as small as a nickel.

The store building has been well arranged for offices and warehouse purposes. The offices on the first floor are handsomely furnished. A portion of the same floor is used for a sample room. The store and sales department are under the management of W. L. Goodrich, who has been actively identified



The New Lightning Pipe Crimper.

with the tinware trade of the West for the last 25 years. The upper floors of this building are devoted to storage purposes, carrying at all times a full stock of kitchen and house furnishing goods. The company's trade covers the whole country from the Atlantic to the Pacific oceans and to the extreme South. They have built up a large Eastern as well as a Western trade. To meet the requirements of such a business and to hold the trade by prompt shipments, it is essential that very large stocks of goods should be constantly carried. Heretofore they have done a large jobbing business in connection with their business as manufacturers, but the rapid growth of their factory trade has now compelled them to discontinue the handling of outside goods and they will confine their attention almost exclusively to their own products.

The committee appointed by Secretary of the Navy Herbert to investigate the charges made against the Carnegie Steel Company, Limited, of furnishing the Government with defective armor plate finished their labors last week and have returned to Washington. It is given out that the proceedings of the sessions will not be made public, but will be incorporated in a report to be made to Secretary Herbert.

The New Lightning Pipe Crimper.

The New Lightning pipe crimper herewith represented is a machine brought out by the inventor, W. A. Wheeler of the Indianapolis Elbow Company, Indianapolis, Ind. This crimper is designed for general use in tin shops, as well as for factories where large quantities of stove pipe are made; rapidity of action and uniformity of work produced being the objects sought to be attained. A leading feature of the new crimper is the manner in which the rolls are brought to bear upon the work. This is accomplished, preferably, by means of a treadle connected with a lever, which, with the arrangement of the parts, gives to the upper rolls a swinging motion and brings them to bear upon the work with a toggle joint movement, thus holding it very rigidly with little or no pressure on the treadle, as the forward movement of the crank in drawing the work through serves to hold the rolls down, relieving the operator of any special effort as to this part of the work. As a matter of fact, if the foot be removed from the treadle after starting the work in it goes through all the same. A slight backward movement of the crank instantly releases the work. This toggle movement, it is pointed out, also acts as a safeguard against any slighting of work by a careless hand, as the depth of crimp does not depend upon the treadle pressure, being regulated entirely by the crank screw at top, which is secured from working loose by means of a lock nut. If desired, this machine may be closed and opened by means of the screw, the change being effected in an instant and without in any manner impairing its efficiency. To effect this the lever is brought down as far as possible and then a pin (not shown in cut) is pushed in which prevents the rolls from swinging, but allows them to rise and fall vertically with the movement of the screw. This feature will be appreciated where odd jobs are to be done, but for turning out work in quantities the treadle will be found preferable. The upper swedging roll is attached to a separate head block which is secured to the swinging frame by means of a clamp made fast by a thumb screw, as shown in the cut. Another thumb screw above this head block furnishes means for adjusting the swedge to different depths without affecting the crimp. The head block is readily removed by loosening the clamp and slipping it off when it is desired to leave the swedge off the work; or the same result may be accomplished quicker by pulling out the spring pin that holds the roll on and then slipping it off. The rolls are made of the best cast steel and hardened and are machine finished all over. They can be interchanged when worn out at one end. A new pattern of screw clamp stand is furnished with each machine, which is both light and strong.

One of the results of the soft coal strike is that the largest fleet of idle vessels ever seen on the Delaware now floats there awaiting the termination of the trouble—and cargoes.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THE W. H. KEELER COMPANY have secured the plumbing and tinning contract on a six-tenement house on South Elm street, Waterbury, Conn.

JOHN J. RULOFFS & BRO. received the contract for the plumbing work and E. P. Bates of Syracuse the contract for the steam heating in the city building at Albany, N. Y.

THE BOARD OF EDUCATION of Minneapolis have awarded the contract for the new Douglas School building to Eric Lunn for $29,295. This does not include the cost of heating and ventilating plant or the system of plumbing for the school, which will be contracted for later.

A SPECIAL COMMITTEE, composed of Messrs. Ulrich, Brady and Holthaus, has been appointed by the School Board of St. Louis to take charge of the repairs and changes to be made to the heating apparatus in the schools, which has been estimated to cost nearly $40,000, and which will include substituting hot air furnaces for stoves and steam heaters for furnaces, according to the schools. In many of the schools simple repairs are required.

THE COUNCIL of La Crosse, Wis., have authorized the Board of Public Works to advertise for bids for a heating plant for the Logan Street School.

H. E. BOTTUM has been awarded the contract for the plumbing in the new *Republican* Building, at Cohoes, N. Y.

AMONG the contracts recently taken by the Baker & Smith Company, 193 to 197 Van Buren street, Chicago, can be mentioned the following: Hot water heating plant in the residence of Gen. C. W. Drew, Calumet avenue, and steam heating plant in the residence of David B. Jones, Lake Forest, Ill.

THE WELLS & NEWTON COMPANY, 274 Dearborn street, Chicago, do the plumbing, sewerage and gas fitting in the flat building of J. L. Wells, 425 Marshfield avenue.

THE WALCOTT-HURLBUT COMPANY, 175 Lake street, Chicago, are to furnish two sections of their Eduction siphon closet range for the United States Indian School at Phœnix, Ariz., and two sections for the Meriden Britannia Company, Meriden, Conn.

THE THEO. JACOBS COMPANY, 72 and 74 Market street, Chicago, are to furnish the steam heating plants for the residence of Leon Mandel, Michigan avenue and Thirty-fourth street, and for the C. & N. W. R. R. depot at Marshalltown, Iowa.

YARRINGTON & MCCABE have the contract for the plumbing at the power house of the Derby Street Railroad Company, at Derby, Conn., and have commenced to put in the waste pipes.

THE BOARD OF EDUCATION OF SOMERVILLE, N. J., have authorized the architect of the new school building to advertise for bids for the heating and ventilation of the school. The building will also have a complete system of plumbing.

GEORGE B. COBB & CO., 96 Centre street, New York, are engaged in installing Florida boilers in the residence of George L Aiken, Rahway, N. J.; G. E. Corry, Bensonhurst, L. I.; F. G. B.

Brown, Keyport, N. J., and H. L. Ward, Tottenville, Staten Island.

Architect James A. Hiscox is making plans for the addition and sanitary improvements to the Roath Avenue School, Norwich, Conn.

A plumbing contract amounting to $45,000 for Cornelius Vanderbilt's summer residence called The Breakers, at Newport, R. I., was awarded to William Lumb & Co., of Boston, Mass.

The Council Committee on the new industrial school at Newport, R. I., have adopted specifications for the plumbing of the new building and have authorized the architect to ask for bids for the steam heating from local steam fitters.

Traynor & Co., Wilmington, Del., have the contract for installing the steam heating plant in the St. Joseph Home of Colored Missions of that city. There are five buildings, including a church, priests' house, sisters' house, the orphanage and a general utility building. Two heavy duty Florida boilers will be used and 7400 feet of the American Radiator Company's radiators. The steam main in starting from the plant is 8 inches in diameter, and it is 390 feet from the boiler to the extreme end of the main, the entire circuit being nearly 800 feet.

The Wells & Newton Company of New York City are engaged in installing the steam heating plant in the addition to the Drew Seminary, at Madison, N. J., where they are using Joy radiators. They are also commencing the installation of the heating plant in St. Luke's Hospital, New York City.

The Smith & Anthony Company of Boston, Mass., will furnish the heating and ventilating apparatus for the new school building at Burlington, Vt., which will be installed by the G. S. Blodgett Company of that city.

Charles R. Watkins, clerk of the Board of Supervisors of Watkins, N. Y., will receive sealed proposals up to June 2 for the steam heating plant of the county building and the plumbing for the court house at that city.

The contract for furnishing the hot water heating system for the county house has been awarded Sullivan & Haynes, Middleburg, N. Y., for $1302.50.

J. S. Brazelton of the firm of J. S. Brazelton & Co., plumbers, Waco, Texas, has been in Belton taking the measurements for the plumbing work in the new hotel that is in course of construction at that place.

The Iowa Construction & Mfg. Company of Sioux City, Iowa, were awarded the contract for furnishing and placing the heating and ventilating apparatus, including elevator power, for the public building in course of construction at Paris, Texas. The amount of the contract is $5500.

E. T. Weymouth, Brooklyn, has recently completed the installation of a steam heating plant in the residence of A. E. Schwartzman of *Puck*, at Nostrand and St. Mark's avenues, Brooklyn, N. Y., using a No. 30 All Right steam boiler.

The S. Wilks Mfg. Company, 113 to 123 Clinton street, Chicago, are to furnish large sized Wilks hot water heaters and tanks for the Indian Agency at Standing Rock, N. Dak.; residence of James W. Willard, Waterbury, Conn.; G. N. Buffington Bath House, Buffington, Ky., and residence of A. W. Green, 4935 Greenwood avenue, Chicago. The company have received a large number of orders for small heaters from various parts of the country, and report business to be in a flourishing condition.

Meisel, Stickney & Co., 43 College place, New York, are installing five All Right steam boilers in the buildings being erected by Jenkins Brothers at 121st street and Eighth avenue.

SCRAP.

The works of the Cynon Tin Plate Company, Aberdare, have been lately added to the lengthening list of closed Welsh tin plate establishments.

Notwithstanding the continued stoppage of a large proportion of the Welsh tin plate works, owing to the refusal of the workmen to make more than 36 boxes per shift, the production of tin plates is reported as being still far in excess of shipments, which have reached a very low figure.

Kahn Bros'. tin plate plant, at 525 East Nineteenth street, New York City, is quite busy turning out the firm's brands of American terne plates to fill orders. Messrs. Kahn report a very active demand for roofing plates at the present time, the domestic product being in special request. For a while the operations of the firm were somewhat hampered, owing to the difficulty of obtaining a sufficient supply of American black sheets, which they use exclusively, but this impediment has been overcome.

Last week executions amounting to $8477 were issued against the McKinley Tin Plate Company of Wilkinsburg, Pa. The concern were chartered on June 8, 1892, with a capital stock of $50,000. The charter members of the company are: L. H. Smith, 240 shares; E S. Wangenheim, 240 shares; H. Y. Haus, 2 shares; S. W. Cunningham, 2 shares; Richard B. Scandritt. 2 shares. Since the organization some Pittsburgh parties have also taken stock. The firm have not as yet made an assignment, but judgment has been confessed to E S. Wangenheim, one of the largest stockholders, in order to protect the company and their creditors. The assets are placed at $15.000 and the liabilities at about the same amount.

The tin plate department now under erection by the Ætna Standard Iron & Steel Company, Bridgeport, Ohio, is expected to be ready for operation about June 1 next.

Two new tin plate manufacturing companies were registered in England lately — namely, the Earlswood Tin Plate Company, Limited, with a capital of $60,000, and the Foxhole Tin Plate Company, Limited, with $100,000 capital, both of Llansamlet, Glamorganshire, Wales. Commenting on this circumstance, the *Iron and Steel Trades Journal* of London says, editorially: "For the moment there is no inducement for any one to invest in tin plate works, but there is a good time coming, and the Welshmen are getting ready for this."

The citizens of Anderson, Ind., are reported as endeavoring to arrange for the location there of a rolling mill to manufacture black plates for tinning.

The Emlyn Steel & Tin Plate Company, Summitville, Ind., are reported to be progressing satisfactorily with the buildings for their tin plate plant, which will, when complete, have a capacity of 150,000 boxes annually.

The New Castle Steel & Tin Plate Company, New Castle, Pa., have contracted with Maris & Beekley of Philadelphia for the supply of a 4 ton traveling crane and two 2-ton trolleys.

The Leechburg Foundry & Machine Company, Leechburg, Pa., have made the first shipment of tin plate machinery to the Ætna Standard Iron & Steel Company, Bridgeport, Ohio, consisting of cold rolling mills, hot rolls, shear, pickling machine, &c.

An attractive little advertising novelty is being distributed by the well-known tin plate house of Merchant & Co., Incorporated, of Philadelphia, New York, Chicago and Brooklyn. It takes the form of a folded card, bearing a faithful resemblance to a miniature box of their famous brand of terne plates—Merchant's Roofing—with all the proper markings of the original. On opening the card an excellent representation of a silvery roofing plate is seen reposing within the box, having a *fac simile* of the firm's registered brand stamped on its face.

One of the youngest on the list of American tin plate works is that of George W. Jaques, Thirteenth avenue and Twentieth street, New York City. Two tinning stacks constitute the present equipment, but these are likely to be added to before long, as they have been kept actively engaged to their full capacity ever since starting two months ago. Mr. Jaques uses American black sheets exclusively, and his product has met with so favorable a reception among the local trade that he has received orders for all of his output for some time to come. "New Process" roofing plates are his specialty at present. Mr. Jaques was for a long period connected with the old established tin plate and metal firm of A. A. Thomson & Co. of this city, and is well known by the tin plate trade.

The Tin Plate Duty.

On Thursday, in the Senate debate on the Tariff bill, the amendment reported by the Finance Committee reducing the duty on tin plates from 1⅛ cents a pound (as arranged in the House bill) to 1 cent a pound was withdrawn, leaving the House rate standing. Senator Aldrich of Rhode Island moved an amendment to make the rate 1⅛ cents a pound, and was supported by Senators Platt and Allison, the latter arguing that the reduction of the duty on tin plates involved a breach of fai h toward those manufacturers who, under the inducements offered by the McKinley bill, had established a successful and promising native industry. Works, he said, had been erected, with a capitalization of nearly $6,000,000, producing 100,000,000 pounds of tin plates per year, and which would have been now producing double that amount were it not for apprehension caused by tariff agitation. The reduction of duty, he asserted, would give a severe blow to the nascent industry. After a lively discussion the amendment of Senator Aldrich was defeated, and the paragraph fixing the duty at 1⅛ cents per pound was agreed to.

The Pittsburgh Fuel Company are reported to have contracted for mining machines to operate their coal pits as a result of the miners' strike.

ROOFING AND CORNICE.

The Country Cornice Shop.

IX.

BY CORNICE WORKER.

Leader Hooks and Coverings.

In Fig. 85 is shown a hook which is used for fastening plain leader to a wall, the blows being struck against A when driving the hook in place.

sition against the wall and then the hook driven over it.

Let us suppose that a straight plain leader is to be put up, having no bends whatever, and that hinged hooks as shown in Fig. 86 are to be used. After having marked the position where the leader is to be placed, drive the first top hook as far as the leader is to project from the wall. Now drop a chalk line with a weight attached at the bot-

removed and the new one put in place. The hinges would then be closed and fastened with new wire.

Fig. 87 represents a hinged hook for corrugated leader; the same method being employed to fasten the hook and leader as explained for that shown in Fig. 86. In Fig. 88 is represented a wall hook used for a square leader, the same as would be employed to fasten such a leader as that shown in Fig. 91.

Fig. 85.—Plain Leader Hook.

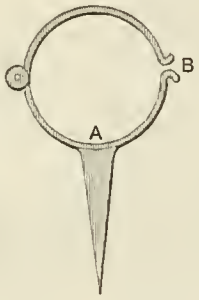


Fig. 86.—Plain Hinged Leader Hook.

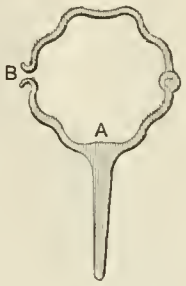


Fig. 87.—Corrugated Hinged Leader Hook.

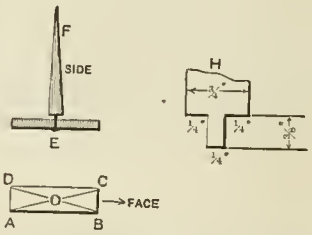


Fig. 90.—Side and Face Views of a Home Made Leader Hook.

Fig. 88. — Wall Hook for a Square Leader.

Fig. 89.—Wall Hook for an Octagon Leader.

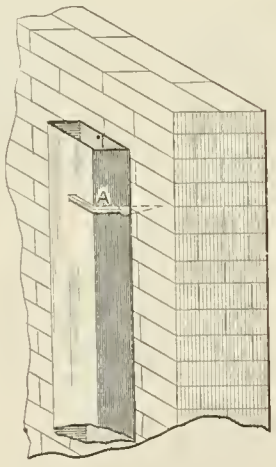


Fig. 91.—Square Pipe Fastened Against a Wall with Hook Shown in Fig. 88.

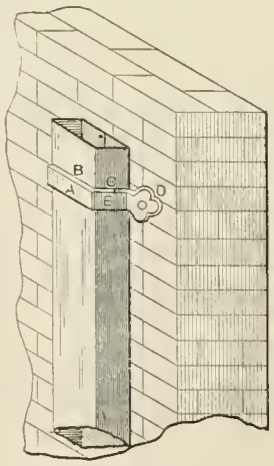


Fig. 92.—Method of Covering the Hook with Metal.

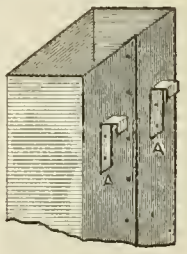


Fig. 93.—Method of Soldering or Riveting the Angles on Leaders.

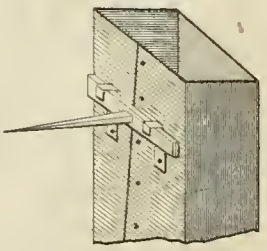


Fig. 94.—Angles Resting on the Hook Shown in Fig. 90.

THE COUNTRY CORNICE SHOP.—ILLUSTRATING LEADER HOOKS AND COVERINGS.

Fig. 86 represents a hinged leader hook, used for putting up plain leaders when it is desired that the leader stand off from the wall, so that in case of an overflow or the leader bursts the wall will not be injured.

When driving the hook into the wall it is opened and the blow struck against that portion indicated by A of Fig. 86.

In using hinged leader hooks they must first be driven into the wall before the leader can be placed in its proper position; but in using the hook shown in Fig. 85 the leader is first placed in po-

tom so as to keep it stretched, fastening the line to the center of the hook A shown in Fig. 86. Now drive as many hooks as are required, being careful that the chalk line meets the center A of the hook, Fig. 86. The leader is now placed in the hooks, the hinges closed and fastened with wire at B, using a pair of plyers with which to twist the wire. By using hinged hooks a great amount of time and labor is saved in case of repairing, or if a new leader was required the wire and hinge would simply be opened, the old leader

In Fig. 89 is represented a wall hook for fastening an octagon leader in the same manner as shown in Fig. 91. The hooks indicated in Figs. 85, 86, 87, 88 and 89 can be purchased from dealers in tinners' supplies, from whom catalogues can probably be obtained upon application.

In Fig. 90 is shown the side and face view of a home made leader hook; A, B, C, D representing the face view, E, F the side view, and H the measurements from which to cut the wedge F, so as to rivet on to the face as shown at

E. The face or front of the hook, A, B, C, D, Fig. 90, is made from a piece of $\frac{3}{16}$ x 1 inch band iron, making the length of A B or C D, Fig. 90, in length equal to the width of the square or octagon leader, which is to lay against the hook, as shown in Fig. 94.

After the piece of band iron is cut to the required length, draw two diagonal lines through the same, as shown from A to C and B to D in Fig. 90, the intersection being shown at O. This indicates the center where the $\frac{1}{4}$-inch hole is to be punched, in which to place and rivet the wedge, as shown at E, Fig. 90. The wedge F, Fig. 90, can be made from $\frac{1}{4}$ x $\frac{3}{4}$ inch band iron. Heat the end F in the forge to almost a white heat, and then with quick successive blows with the hammer, stretch it to almost a point, wedge shape, as shown. Three inches of the wedge driven into the wall will be sufficient to uphold the leader. Now if the leader is to project 2 inches over the wall line, and 3 inches are required to drive into the wall, then the wedge must be cut 5 inches in length. The rivet end of the wedge, shown at E, Fig. 90, is cut and filed as shown at H, Fig. 90, the full size measurements being given.

The $\frac{1}{4}$ x $\frac{3}{8}$ inch rivet shown at H must be filed perfectly round so as to fit the $\frac{1}{4}$-inch round hole punched in the face of the hook, shown at O, Fig. 90, and to which it will be riveted as shown at E, Fig. 90. After it is riveted the rivet head E should not project over the face of the hook any more than $\frac{1}{8}$-inch, so that the leader will lay well against it. In driving the hooks into the wall care must be taken that they are all on a plumb line, using the chalk line as before explained, and that each hook has the same projection over the wall as the other, otherwise the leader will not lay tight against the hooks.

In Fig. 91 is shown a perspective view of a square pipe, or leader, fastened against a wall by means of the hook shown in Fig. 88. It will be noticed that the riveted side of the square leader shown in Fig. 91 lays tight against the wall and that the hook A of the figure corresponds to the hook A of Fig. 88, and is driven into the joint of the brick work as shown in Fig. 91. If the hook was left in this position it would make a bad appearance; to overcome which a galvanized sheet metal covering is placed over the hook, using galvanized iron for a galvanized iron leader and copper covering for a copper leader. The appearance is shown at A in Fig. 92. The covering A in Fig. 92 is slipped over the hook shown at A in Fig. 91 and soldered along the top of the covering and against the leader, as shown at B and C, Fig. 92, thus making a clean and neat appearance.

In Fig. 93 is a perspective view of a square leader, showing the method of soldering or riveting to the leader the angles for fastening the pipe or leader which is used in connection with the home made leader hook in Fig. 90. These angles can be made about $1\frac{1}{2}$ inches wide and so long that two rivets can be riveted through the leader and angle with ease. If it is not convenient to rivet the angles they can be well soaked with solder, which also gives a good hold. The hooks on these angles should be made a little larger than the size of the face of the leader hook shown in Fig. 90, which is $\frac{3}{16}$ x 1 inch in size. When making the angles use about No. 14 gauge iron. In Fig. 94 is shown a perspective view of the leader and angle resting or hanging on the hook after the latter has been driven into the wall. These hooks can also be used for round leaders of any size by simply bending the face of the hook shown in Fig. 90 to the required circle. It is usual to place these hooks about 8 feet apart, being careful about having them on a plumb line, as before explained, and then taking a long wooden rod about $1\frac{1}{2}$ x $1\frac{1}{2}$ inches by 15 to 18 feet in length and laying it against the hooks driven in the wall, mark off the hooks on the rod, then transferring these distances to the leader, solder or rivet on the angles shown in Figs. 93 and 94. In putting up leaders with the use of these home made hooks a little more time may be required, but when the job is completed the leader gives a neat appearance because no hooks or bands are exposed to view. In putting up any kind of leaders or hooks the latter are generally driven into the wall by reaching out of the windows. Sometimes the leader is placed where the windows are too far distant and then a sitting scaffold must be used, a device which will be found very convenient when executing such a job.

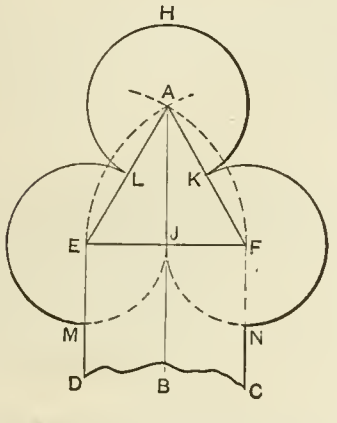


Fig. 95.—Method of Obtaining the Geometrical Figure or Leaf Shown at D in Fig. 92.

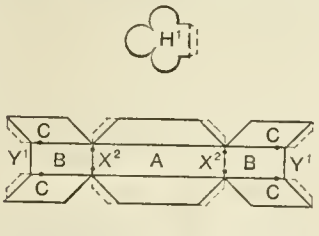


Fig. 93.—Joining in One Piece the Pattern for Front and Sides of Covering; also Pattern for Leaf.

Patterns for Coverings.

In Fig. 95 is shown the method of obtaining the geometrical figure or leaf for the sheet metal covering as indicated at D, Fig. 92. To obtain the leaf proceed as follows: Draw any perpendicular line, as A B, Fig. 95, upon either side of which place the half distance of the width the covering A, Fig. 92, is to have, as shown by the line E F, drawn at right angles to A B, in Fig. 95. Now upon this line construct an equilateral triangle, or a triangle having three sides equal. With F, Fig. 95, as center and F E as radius strike and arc as shown from E to A; then with E as center and E F as radius strike another arc, intersecting the first one at A. Now draw a line from A to E and from A to F; then will A E F represent the triangle desired. It will be noticed that the line A B, Fig. 95, bisects the line E F at J. Now with F as the center point for the compass and with F J as radius strike an arc, cutting the line A F at K; then with A as center and with the same radius strike another arc, cutting the line A E at L. Then again with E as center and using the same radius strike an arc from the point L, meeting the point J on the line E F. Now at right angles to E F, or parallel to A B, drop lines as shown from E to D and F to C. The distance N to C, or M to D, can be made to the width desired, as indicated at A, front view, Fig. 96. Then will C N H M D represent the leaf desired. It should be understood that the width of the covering shown from E to F in Fig. 95 gives the basis for obtaining the center point from

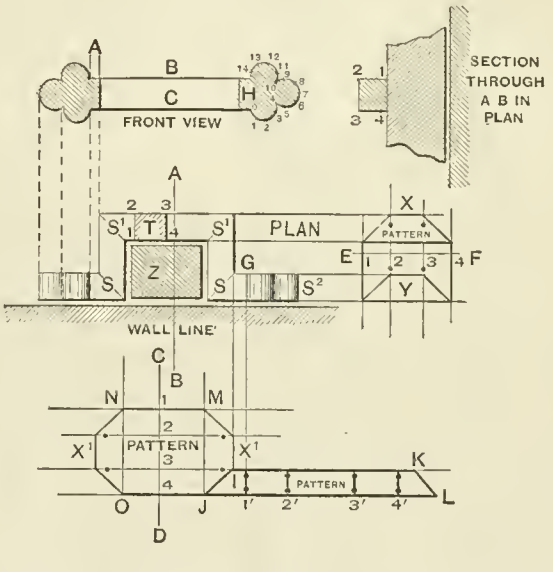


Fig. 96.—Front, Plan and Sectional Views of Hook Covering; also the Patterns.

which to strike the arcs, and therefore makes the leaf in proportion to the width of the covering.

In Fig. 96 is shown the front, plan and sectional views of a hook covering, including the patterns. Let Z in plan represent the size of the leader used, laying against the wall, as shown, around which is placed the plan view of the covering. The width of the front view of covering shown from B to C should be made from 1 to 1½ inches, according to the size of the pipe used: while the width shown from 1 to 2 or 3 to 4 in plan, or what is the same, the width from 1 to 2 or 3 to 4 in the section, should be made a little wider than the width of the hooks shown at A, Fig. 88, or A, Fig. 89, so that the covering will slip over easily. After having the front and plan views drawn in their proper position to each other, as shown by the dotted lines, draw a section of the covering in the plan, as shown at T, from which to obtain the stretchout. S, S', S', S represent the four miter lines in plan. To obtain the patterns for the coverings proceed as follows: At right angles to the line S' S' in plan, draw the stretchout C D, as shown, upon which place the stretchout of the section T in plan, as shown by the small figures 1, 2, 3 and 4, corresponding in number to those on the section. Now at right angles to the stretchout C D draw lines indefinitely through the small figures, as shown, which intersect with lines of corresponding numbers drawn from the miter lines S' and S', parallel to C D. A line traced through these intersections will be the required pattern for the front of the covering shown at A, Fig. 92. For the pattern of the side of the covering, shown at E, Fig. 92, proceed as follows: Parallel with the line S' S', Fig. 96, draw the stretchout E F, upon which place the stretchout of the section T of the plan view, as shown by the small figures 1, 2, 3 and 4 on the stretchout line E F. At right angles to the stretchout draw lines indefinitely through the small numbers, as shown, which intersect with lines drawn at right angles to the line S' S, from the miter lines S' and S. A line drawn through these intersections will be the required pattern for the two sides of the covering, as shown at E in Fig. 92. The pattern for the front and sides of the covering can be made in one piece if desired. In Fig. 97 let A represent a duplicate of the pattern of the front, as shown by M N O J, Fig. 96, and B B, in Fig. 97, represent duplicates of the pattern of the side shown by X E Y F, Fig. 96. It will be noticed that X of the pattern for the side in Fig. 96 joins X' and X' on either side of the pattern for the front in Fig. 96, the joining being shown at X^2 X^2, Fig. 97. Then will B A B, Fig. 97, be the desired pattern for the front and two sides of the covering. Laps are allowed as shown by the dotted lines in Fig. 97. For the pattern of the strip which bounds the leaf H, front view, Fig. 96, proceed as follows: At right angles to C D of the pattern, Fig. 96, draw the lines 3 and 4 indefinitely to the right, as shown by 3 K and 4 L. It should be understood that the width 3 4 of the pattern on the line C D, Fig. 96, is the same as the width 3 4 of the section, and is the width of the strip which bounds the figure H in front view, as shown by S S^2 in plan view. From the bend G in plan view, which corresponds to the angle 1 and 14 of the leaf H in front view, drop a perpendicular line cutting the lines I K and J L, as shown at 1' of the pattern. Now space the leaf H, front view, Fig. 96, into an equal number of parts, as shown by the small figures from 0 to 14; transfer the spaces with the dividers from 0 to 4, front view, on the lines I K and J L, from 1' to 2'. Now transfer the spaces from 4 to 10, front view, to the pattern, as shown from 2' to 3'; then again transfer the spaces from 10 to 14, front view, to the pattern, as shown from 3' to 4'. Now place a duplicate of the miter 1' J I, Fig. 96, as shown, at 4', L and K, which completes the pattern. Then will I J L K, be the pattern for the strip bounding the leaf H, front view, Fig. 96. The miter I J will be cut away from the pattern of the front, as shown. The leaf H', shown in Fig. 97, is a duplicate of the leaf H, front view, Fig. 96. A lap is allowed at H', Fig. 97, which is bent at right angles and soldered to Y' Y', Fig. 97.

Bending the Covering.

If a bar folder is at hand, the pattern shown in Fig. 97 could be bent upon the two lines C C and C C, after which the cross bends could be bent by hand as shown by X^2 X^2, Fig 97, and soldered to their required angles. If a folder is not at hand the pattern B A B, including the leaf H', Fig. 97, and the strip for the leaf shown by I J L K in Fig. 96, could be bent upon the hatchet stake previously shown in Fig. 6.

FLASHINGS.

A FRENCH CONSUL in Burmah, in a recent report to his Government, states that galvanized iron is coming into use in the buildings of the country to a marked extent. Only a few years ago, he says, all the native houses, rich and poor alike, were built entirely of wood and roofed in with grass or leaves. The low price at which iron can be had nowadays has encouraged the Burmese to use it more and more in the construction of their shops, barns, or outhouses. Thus galvanized and corrugated sheet iron is now in general use for roofing purposes, while nails and metal bolts are being substituted for wooden pegs and plugs. These goods are consequently in steady and growing demand.

RHODES, DICKELMAN & Co., Forest, Ohio, report that they are meeting with far greater success with their new eave trough and hangers than their most sanguine expectations, having within the past 90 days established agencies very broadly, and at the present time have in addition placed their goods in over 15 States with the largest jobbing houses, who speak of their merits in the highest terms.

JOHN LE SAUVAGE has recently moved to 37 Duane street, New York, where he has fitted up a shop and is prepared to do all sorts of tin, copper and sheet iron work. He makes a specialty of remedying defective flues, a character of work with which he has had a large experience that has brought him a number of recommendations.

Frank Steele, Charles Gifford and George W. Nelson of Oriskany, N. Y., discovered a few days since in the Mohawk River, opposite the old Oriskany battle ground, two solid round cannon balls in about 3 feet of water, imbedded in the clay. The balls weighed originally 30 pounds, as they weigh 29¾ now. The portion imbedded in the clay is in an almost perfect state of preservation, while about one-third of the surface is considerably corroded by the action of the water. It is calculated that the balls had been there over 117 years, as the battle was fought August 7, 1777.

Trade Notes.

MANY OF OUR READERS and all of our advertisers will be interested in the announcement elsewhere in this issue of A. Mugford, Hartford, Conn., who is a well-known engraver and electrotyper. He makes a specialty of doing work for the heating trades, and as the brief list of references in his advertisement shows, does work for many large and well-known concerns. He has had long experience in designing and engraving advertising matter especially adapted to the trades represented by *The Metal Worker*.

THE TINNERS' MACHINERY & SUPPLY COMPANY, 9 Cliff street, New York, issue a card giving net price-list of Skylight Gearing, a stock of which they carry on hand ready for shipping. On the back of the card are illustrations of the different parts of the Gearing.

TIN ELBOWS AND ANGLES are advertised in this issue by the Excelsior Steel Furnace Company, 38 West Monroe street, Chicago. They make three and four piece Elbows and Angles of 22½° and 45°, in any size from 7 to 20 inches. Those who have not yet used the company's goods can save $1 on their first order for $10 worth or more by cutting out the coupon which appears as part of the advertisement.

THE ADVERTISEMENT elsewhere of the Griswold Mfg. Company, Erie, Pa., directs attention to the Erie Aluminum Ware of their manufacture. The various advantages of this ware are pointed out and particular attention is directed to the Erie Aluminum Kettle, made from cast metal and used for preserving. Fruit acids will not affect it and it is noted in addition that there is no enamel to flake off or plating to wear.

THE DONOHUE PATENT SOLDERING COPPER HANDLE is the subject of an announcement of the Cleveland Rule & Handle Company of Cleveland, Ohio. An illustration of the Handle is shown and general description presented; also a list of firms handling it.

GEORGE BROTHERS, agents for Acorn stoves and ranges at Chaumont, N. Y., report having received the first premium on their display of Ranges at the Watertown, N. Y., fair held recently.

THE ANNUAL MEETING of the John Torrey Mfg. Company was held at the office in Portsmouth, N. H., May 14, and the old officers re-elected. The business of the past year was reported as satisfactory and the sale of Stovene, a paste stove polish, which is the leading specialty of the company, now extends to every State and Territory in the Union. Besides Stovene a paste shoe blacking and a liquid dressing for shoes are manufactured. During the past year the company have removed their plant from South Newmarket, N. H., to Portsmouth, N. H., where they occupy a large factory and have at their command every appliance for the production of the articles above named.

THE STANDARD RADIATOR COMPANY, Buffalo, N. Y., and 167 to 169 Lake street, Chicago, have received orders for over 25,000 feet of radiation from the Modern Heating Company, American Heating Company, Boyce & Co., and Ring & Reardon, St. Louis.

PLUMBING and GAS FITTING.

Plumbers' Convention Delegates.

The master plumbers' associations all through the country are electing delegates to the Twelfth Annual Convention of the National Association of Master Plumbers to be held at Detroit June 19-21. The delegates that will be sent from Pittsburgh were given in *The Metal Worker* May 5; from Rochester, N. Y., and New York City May 12; from Texas, Massachusetts, Baltimore and Philadelphia May 19. Some of the other States and cities will be represented, as follows:

BOSTON, MASS.

J. Warren French, J. W. Cosden, David Smith, J F. Davlin, Dan'l Shannon, T. E. Sharp, P. H. Winn, E C. Kelly, D. G. Finnerty, J. C. McCool, T. J. Hartnett, Isaac Riley, H. H. Collins, Wm. A. Tucker, Jno. Crawford, Jno. C. Boyd.

NEWARK, N. J.

Elias Berla, Alex. Donn.

ST. LOUIS, MO.

P. Madden, Wm. Mortimer, E. J. Lonergan, E. P. Reardon, Jas. McCartin, John McMahon, Ed. Schceneman, A. J. Gallagher, J. C. Mitchell, D. J. Collins, Jeremiah Sheehan, Jas. Kelly, John Shelly, Wm. F. Stein, J. M. Life, Ed. Gardner, C. H. Carroll, Ed. Zausch.

NEW HAMPSHIRE.

F. Lane, Manchester; E. Lessard, Manchester; P. Clifford, Concord.

NEW YORK STATE ASSOCIATION.

W. J. McDermott, Chas. Geiger, J. A. Rossman.

RHODE ISLAND.

D. L. Fales, Pawtucket; Samuel Jackson, Pawtucket; Joseph Haire, J. Cremin, Newport.

WASHINGTON, D. C.

Jos. R. Quinter, Edw. J. Hannan, Jas. Ragan, Dan'l Hannan, Jas. Nolan, Jas. Cunningham.

TOLEDO, OHIO.

Jno. A. Waite, Jno. E. Shultz, Jno. P. Lawrence, Robt. Raitz.

BRIDGEPORT, CONN.

Thomss Logan, president; L. H. Mills, H. B. Middlebrook, James Cook and Geo. E. Schofield, alternates.

WILMINGTON, DEL.

James F. Traynor and Alfred Gawthrop.

IOWA STATE ASSOCIATION.

J. A. Harris, Sioux City; J. E. Allen, Des Moines; J. Burnside, Des Moines.

MILWAUKEE, WIS.

Chas. Polacheck, W. E. Goodman, Ferd. Wittig, W. H. Halsey, A. R. Schwind, Ed. Grassler, L. H. Plum.

CONNECTICUT STATE ASSOCIATION.

Jas. Ahern, Hartford; S. E. Dibble, New Haven; J. Donovan, Middletown.

KANSAS STATE ASSOCIATION.

John Shinn, Topeka; Philip Bertrand, Wichita; James Foley, Leavenworth, and C. J. Prescott, Topeka.

Trade School of the North End Union, Boston.

The directors of the North End Union, a beneficent institution established in the city of Boston for the benefit of the less favored classes of the community, recognizing the value and importance of a definite trade training for American mechanics, determined last year to add a trade school to their work. With this object in view they issued in November a pamphlet appealing for aid in establishing such a school. Through the generosity of friends of the movement in Boston sufficient funds were provided to erect the necessary building and to equip an initial class, the plumbing trade being chosen as the first to be taught. On January 24 of this year the plumbing school was opened under the instruction of William L. Pierce, foreman for one of the leading plumbing firms of Boston, and it has so far proved remarkably successful.

Samuel F. Hubbard, superintendent of the union, writing to us recently, says in reference to the class: "Our little school has been started as an object lesson to encourage, as far as an example can do, the growth of the trade school idea. We have accommodation for only 29 pupils, and every place was filled within a week after the announcement was made. We have numbers on the list for the fall term. We are having the hearty co-operation of the master plumbers. Wm. H. Mitchell, president of the State Master Plumbers' Association, has given it much attention, and T. J. Tute has given most of the lectures."

The general plan of instruction closely follows that in operation in the New York Trade School, known as the Auchmuty system. The course consists of 50 lessons on two or three evenings of each week, ending in May. Examinations are then held by a committee of master and journeymen plumbers, when certificates are given to those pupils who are successful in passing the tests.

The general regulations are as follows: Seventeen years is the minimum limit of age at which scholars are admitted, and a reference as to character is required from each candidate. A fee of $10, payable in advance, is charged. All the required tools are provided for each pupil and materials are supplied free of cost. No one is admitted for less than the entire course.

The course of instruction is made progressive and is designed to cover the whole theory and practice of sanitary plumbing as thoroughly as possible. Each pupil is required to do the following work in the order in which it is given:

1. Seams.
2. Overcast joints.
3. Cup joints.
4. Calking.
5. Wiping horizontal round joints.
6. Wiping horizontal branch joints.
7. Wiping upright round joints.
8. One-fourth bends.
9. Wiping upright branch joints.
10. Wiping on a stop cock.
11. Wiping a flange on a 2 inch pipe.
12. Wiping a 2 inch ferrule.
13. Wiping a bath plug.
14. Wiping a vertical branch.
15. Wiping an upright flange.
16. Traps.

On completion of this course miscellaneous work is done, such as wiping 4-inch ferrules, making tank seams, wiping 2 and 3-inch joints, making service boxes, bottle traps, sand bends and fancy work. Lectures are also given at stated intervals explaining the principles which underlie the craft of plumbing, and every effort is made to impart to the learners as complete a knowledge as possible, within trade school limits, of the practical and scientific sides of the trade, leaving facility and speed of execution to be acquired subsequently by practice in the trade itself.

The first commencement exercises of the plumbing school of the North End Union were held in the Union hall on the evening of May 23, when the students were addressed by several prominent plumbers and others interested in trade school work. Samuel F. Hubbard, superintendent of the Union, presided, and was supported by Daniel G. Finnerty, president of the National Association of Master Plumbers; Wm. G. Mitchell, president of the State Association; William H. Sayward, secretary of the National Association of Master Builders; Samuel B. Capen, Rev. Charles J. Ames and others, who all indorsed the work of the school and expressed the hope that there would be a far larger number of trade schools in existence in this country. Specimens of the work of the pupils were on exhibition, and elicited the unqualified approbation of the visiting expert plumbers.

Superintendent Hubbard announced that the class would be resumed early in the fall. The plumbing class has been limited in number, owing to lack of room, but this drawback will, it is hoped, be overcome in time, as the school enlarges its borders. Other trades will also be taught. All communications in reference to the school should be addressed to Samuel F. Hubbard, superintendent, 20 Parmenter street, Boston, Mass.

The Consolidated Lehigh Slate Company, 154-156 South Fifth avenue, New York, make a specialty of plumbers' slate goods. At their showrooms samples can be seen of slate slabs for pantry sinks with splash and drain boards. They also show slabs for water closet bottoms and both round and square slabs for corner lavatories. A slate tank such as is used for chemicals is shown, and also slate urinal stalls. Register borders for both round and square registers in all standard sizes are carried in stock, and special sizes can be furnished at short notice. A specialty is making slate work to specification, and they are in possession of facil-

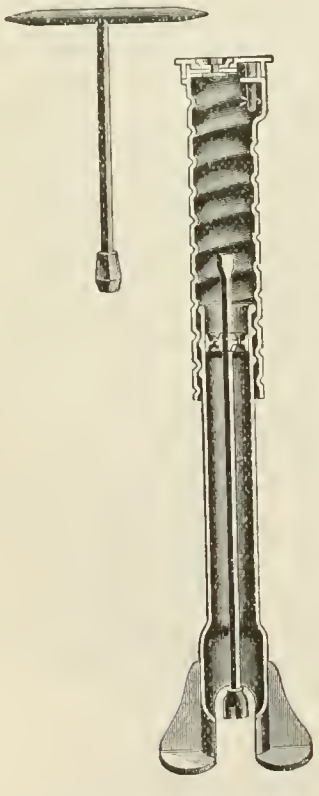
ities by which orders can be promptly filled. They also do a large business in roofing slate.

The Illinois Master Plumbers.

The Executive Committee of the Illinois Master Plumbers' Association held a meeting in the rooms of the Chicago Master Plumbers' Association, 173 Madison street, Chicago, on Monday, May 21. The committee is composed of the following members: President, Robert Loudon, Bloomington; vice-president, W. T. Geary, Chicago; treasurer, J. R. Scanlan, Elgin; Wm. H. Durham, Rockford, and T. P. Culloton, P. Sanders, David Whiteford and A. W. Murray, Chicago. The meeting was called to advance the interests of the State association, and judging from the reports read from nearly all parts of the State the various local associations are in a flourishing condition. It was moved by Mr. Murray that the place of meeting of the State convention be selected by the president and vice-president. On motion by Mr. Wade, it was decided that the convention be held Thursday, June 7. As Secretary W. E. Goodman had retired from business, J. B. Breen of Chicago was appointed to take his place.

National Service Box.

Ette & Henger Mfg. Company, St. Louis, Mo., are offering service boxes as shown herewith. The special feature

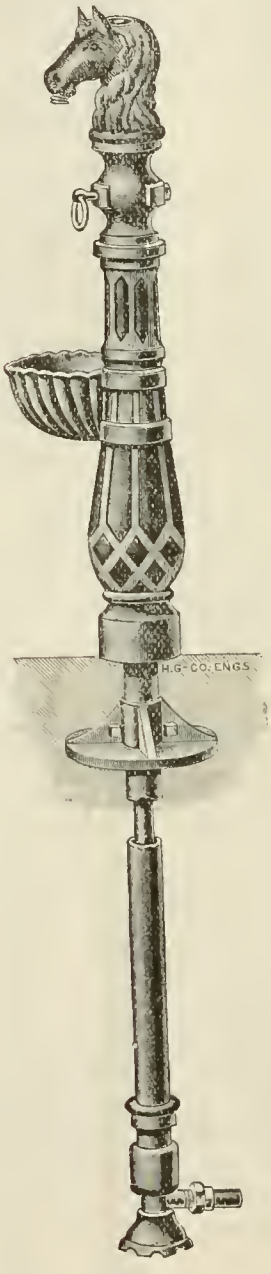


National Service Box.

is a stationary rod inside the box, attached to the service cock, and extending to within 12 or 18 inches of the surface. The combination key shown at the left of the box is adapted to opening the cover and also to fit on the end of the stationary rod, the same key serving both purposes. The manufacturers refer to the greater convenience of the short key as compared with the old style of long key for turning off or on, and state this device for stationary rod can be used in connection with all lengths and sizes of service boxes made by them.

Compression Stable Hydrant with Drinking Fountain.

Ette & Henger Mfg. Company, St. Louis, Mo., are offering the stable hydrant and fountain shown herewith.



Compression Stable Hydrant with Drinking Fountain.

The hitching post is ornamental and extra heavy with a stock 4 feet high, cast in one piece, the water passing through the inner pipe. A wheel handle is furnished instead of a key for turning the water on or off when so desired. A heavy flange is placed on the pipe to prevent the post being moved out of the ground by either horse or frost and to relieve the valve from strain. The manufacturers claim the device is anti-freezing, that there is no packing in the top parts and that it can be repaired without digging up. The posts are made to set in the ground from 1½ to 10 feet.

TRAPS AND VENTS.

An interesting case was recently decided in the New York courts which determines the standing of plumbers who have not complied with the law requiring registration with the Board of Health. An unregistered plumber sued for payment of work in the District Civil Court and won his case. On appeal to the General Term of Common Pleas, it was brought out that the plaintiff had not passed his examination, and the judgment in his favor was therefore set aside. If it becomes generally understood that work done by unlicensed plumbers is illegal and payment cannot be collected in the courts, it will have great effect in making all legitimate members of the trade comply with the strict letter of the law. It is said that there are over 500 plumbers at present in New York who are carrying on their business contrary to law, and it is extremely probable that a great many out of this number are not true plumbers at all, and if they can be compelled to stop work it will be much to the benefit of the regular plumbers in the business.

The State Association of Master Plumbers of Kansas met in their fourth annual session as Kansas City last week. There was a large attendance, nearly every firm doing business in the larger cities being represented. The convention was presided over by William Rowan of Arkansas City. The next meeting will be held in Topeka. Officers were elected for the ensuing year as follows: James Foley, Leavenworth, president; John Beasley, Pittsburgh, vice president; F. W. Doane, Lawrence, secretary; G. W. Searles, Atchison, treasurer.

Wright Brothers have opened their plumbing store and shop in Jones' Block, Ipswich, Mass. They have stoves, tinware and plumbing stock.

Clarence Hall has purchased the plumbing and piping business of R. W. Whelden & Co., Oldtown, Maine.

P. J. Casey of Claremont has opened the plumbing business in Lewis' Block, on Sunapee street, Newport, N. H.

The next convention of the State Association of Master Plumbers of Texas will be held at Austin some time in May, 1895.

The Coyne & Delaney Mfg. Company were recently incorporated under the laws of the State of New York to manufacture plumbers' supplies and metal ware in Brooklyn. Their capital is placed at $50,000. The directors named are Thomas F. Coyne, John J. Delaney and Hartman Hebeler of Brooklyn; Fred. A. Meyer of Rockaway Beach and Thos. D. Riley of New York City.

The Cleveland Rule & Handle Company, Cleveland, Ohio, send out card circulars directing attention to the Donohue soldering copper handle which they manufacture.

The Armstrong Mfg. Company, Bridgeport, Conn., say that the recent improvements made in the Armstrong pipe threading and cutting off machines have decidedly increased the demand for them. The same firm also report a brisk trade in their stock of dies and other tools for water, gas and steam fitters' use.

The charter of incorporation for the Association of Master Plumbers of the City of Memphis, Tenn., was filed for registration last week. J. A. Bailey,

John J. Bailey, C. E. Shinnick, A. Lagomarsino, Joe Massa, F. W. Reinhardt, C. J. Schultz, George T. Tweedy, Louis Tisdale, Frederick Fisher, John Hopkins, W. B. Lockey, Thomas McGrath, Edward McGowan, P. Callahan, R. H. Woods and Martin Woods are the incorporators.

FIRE completely gutted the plumbing shop owned by A. Levy, at 4009 State street, Chicago. It was partially insured.

THE MASTER PLUMBERS' ASSOCIATION of Salem and Vicinity has affiliated with the National Association. The association has 23 members, as follows: Salem—J. H. Trow, secretary; Jos. A. Andrews, John F. Cabeen, Frank Dearborn, H. M. Cawley, Frank Wendall, P. H. Sweeney, Geo. Norton, Chas. H. Phippen, Wm. H. Hart, C. J. Driscoll. Beverly—R. Robertson, president; J. Robertson, D S. Ingersoll, C. G. Pickett, A. M. Stevens, Wm. A. Weber. Peabody—Daniel B. Lord, E. G. Kelly, Geo. H. Norton & Co. Danvers—C. P. Perkins & Co., J. E. Ropes & Co., Caskin & O'Connell.

A MEETING was recently held by the master plumbers of Lynn, Mass., for the purpose of organizing an association. National President Daniel G. Finnerty, P. H. Winn of Nahant and several members of the Salem Association were present. The organization was started with 15 charter members and elected J. F. Morgan president, E. D. Russell secretary and J. C. Donnelly treasurer.

AT A RECENT MEETING of the Master Plumbers' Association of Cambridge, Mass., all the master plumbers of the city were invited. National President Daniel G. Finnerty and J. Warren French, president of the Boston Association, were present. A. Baumeister presided and addresses were made by the guests and the Inspector of Plumbing of Cambridge. After the meeting a banquet was served.

THE ATTENTION of the passer by is attracted to the establishment of the Colwell Lead Company, 63-65 Centre street, New York, by new plate glass windows in the front and a fresh coat of light colored paint and the regilding of the faucet which has hung in front of the establishment for years. Inside a greater display is made of plumbing goods than heretofore. The Scioto siphon closet is set up in working operation and a fine display of lavatory bowls is hung around the showroom. The office department is on the upper floor. Back of this building is the works and warehouse, which extends through to 524 Pearl street. Here are arranged their hydraulic pipe presses for making lead, tin and tin lined lead pipe; also their tower for making shot in all sizes from duck shot to buck shot. Their sheet lead mill, capable of turning out lead in sheets 8 feet in width and of various lengths and thicknesses, occupies a portion of this building. In the warehouse is a stock of all kinds of pipe and sheet lead, so that no order is long unfilled. They also make a specialty of cames for glaziers' use, both milled and unmilled. On the other side of Centre street a large building, at 66-68, is used by them as a storehouse for a general line of plumbers' supply goods.

ANTHONY F. BIEHL, a well-known plumber of Lancaster, Pa., died quite suddenly last week of pneumonia, after a brief illness. He was 44 years of age and is survived by a wife. He was a member of the St. Michael's and St. Anthony's societies and the New Knights of St. John's.

A. J. HUSTON, representing the Hart Mfg. Company of Cleveland, Ohio, is visiting the pipe and fitting trade of New York City in the interests of their Duplex stocks and dies to use for threading pipe and bolts. One of the features of the tool is that after the thread is cut it can be removed from the pipe or bolt without the slow process of unscrewing.

GEORGE BROWN of the plumbing firm of Brown & Byrne of New York City has entered into partnership with Amsbury & Son in the plumbing business at Penn Yan, N. Y.

LATTA AND FRANK LEIBOLD are placing goods in the Benham store room on Lincoln avenue, Goshen, Ind., for a plumbing establishment.

DU BOIS & DARRAGH, 61-63 Gold street, New York, have the New York agency for the Eureka smoke testing machine manufactured by the Bailey-Farrell Mfg. Company of Pittsburgh, Pa. They are meeting with considerable demand for this character of apparatus, and the smoke test is growing in popularity with plumbers owing to the fact that leaks can be detected by seeing the smoke escape as well as by the sense of smell.

GUIMARIN & BIXBY are a new plumbing firm at 9 South Broad street, Atlanta, Ga.

THE MOSELY FOLDING BATH TUB COMPANY, 161 South Canal street, Chicago, have issued an exceedingly artistic catalogue of their specialties. It comprises 32 pages of illustrations and descriptive matter. An introductory article sets forth the special features of the Mosely folding bathtub and gives details of the character of the materials entering into its construction. The styles shown are the Atlantic, Pacific, Northern, Southern, Wagner, Hub, Columbia, Armour, Exposition, Chicago and Pullman. These differ in details of style and finish as well as in methods of operation. All are folding tubs, but some are made to be heated with gas, others with gasoline and others to be attached to regular water service. Those with tanks and heaters attached are portable and can be placed in any room, thus making it unnecessary to have a special bathroom in a house. The catalogue also shows the Petite, a combined bidette, chiffonier and wardrobe. All their goods are very handsomely finished and some are richly decorated. Separate illustrations are given of the Mosely improved water heater, the Security waste and overflow combination faucet and a special supply faucet for supplying water by pressure to both tank and tub.

G. A. STANFIELD, who for the past two and one-half years has been in the employ of the Marietta Plumbing Company, has established himself in the plumbing and gas fitting business at 411 Second street, Marietta, Ohio.

JOHN HILDEBRANDT is fitting up a room on Fourth street, Logansport, Ind., where he will establish himself in the plumbing and gas fitting business.

PORTSMOUTH MACHINE COMPANY, Portsmouth, N. H., who are sole proprietors and manufacturers of Critchley's patent expanding reamer, advise us that the demand for this specialty still continues active. This concern also make an extensive line of plumbers' brass goods.

Alfred Hopkins.

At a special meeting of the Bridgeport, Conn., Master Plumbers' Association, last week, the following resolutions were offered and adopted in remembrance of the death of Alfred Hopkins:

Whereas, The untimely death of our dear friend, Alfred Hopkins, has removed from our midst one of the most popular members of our Bridgeport Master Plumbers' Association;

Whereas, The good Lord has seen fit in His wisdom to call him to a happier resting place above;

Whereas, The members of our association will miss him at their regular meetings and on their pilgrimages each year to State and national association gatherings, held for the elevating of our craft in knowledge and skill in their profession, for the benefit of the health and convenience of mankind in general:

Whereas, Without his good fellowship and practical experience our meetings will never seem the same again, with him absent from our side;

Whereas, His friends always felt renovated in mind after meeting him, he was so genial in his greeting, so generous to his friends and the deserving poor;

Whereas, He was sought after by hosts of friends, by his employees and others that needed a kind and sympathetic shake of his hand, with a cheering word in their hour of trouble. His consideration and good advice often lifted the load from their minds and they departed from his presence with new courage;

Whereas, The lesson taught to the members of our fraternity in losing our companion should be kept continually in our remembrance, as the same summons might overtake one of us. We then should be prepared to meet that unseen and unknown country, leaving this mortality for that immortality beyond this vale of life's struggles;

Resolved, That by his death we have lost a valuable member and the city of Bridgeport a good citizen. To his family in this their hour of bereavement the members of our association extend their heartfelt sympathy;

Resolved, That these resolutions be placed upon the records of the association, and that an engrossed copy of them be sent to the family of the deceased.

The closing of all the workshops of the Grand Trunk Railroad is being seriously felt in Canada. In Montreal alone some 2500 men have been thrown out of employment.

The *Iron and Steel Trades Journal* of London reports that the demand for galvanized iron for shipment abroad was never so heavy as at present, notwithstanding the fact that owing to the depression in Australia, those colonies—usually the largest customers—are taking only about one-half of their usual supply. The use of galvanized iron throughout the world is growing rapidly, and new markets for this material are opening up annually.

The new $3,000,000 tunnel built through the Palisades by the Susquehanna & Western Railroad was formally opened for coal traffic on May 15. The tunnel is nearly 2 miles long.

The successful completion of the Manchester Ship Canal on the west coast of England has induced the trading community of Sheffield to take steps for carrying out the long contemplated plans for a ship canal from their city to the eastern coast. A company has been formed for the purpose, and a bill is now before Parliament authorizing the work of construction.

STEAM AND HOT WATER.

Cost of Heating Plants.

The question of ventilation in the public schools is just now engrossing a good deal of attention, says a writer in a Worcester, Mass., paper, and how to have the rooms heated and the air pure is the problem. Bids have been asked by the city for the heating and ventilation of Thomas and Winslow street school houses. Changes have been ordered in these buildings by the State officers.

There are various systems in use in the schools, and the cost for each room varies from $40 to $108, as shown by the report of the Superintendent of Public Buildings. It has always been a question why there should be such a difference, and people have wondered why one room could not be heated just as cheaply as another under the same conditions.

The Canterbury, Belmont and Salisbury street houses and the English High School are all provided with a mechanical system of ventilation, that is, a system where steam engines are used to run a fan. These buildings are also heated by steam.

In the Winslow and Thomas street schools there is no system, and these two buildings will have to be ventilated this season.

Lamartine and Downing street schools are provided with the furnace system of ventilation. In Ash street is the Sturtevant system. The following figures from the report of the Superintendent of Public Buildings show the cost of heating and ventilating each of the buildings mentioned, and also each room:

	Rooms.	Total.	Per room
Canterbury street.. ...	12	$1,293.70	$108.22
Belmont street...	16	854.65	53.42
Winslow street.....	13	828.81	63.76
Salisbury street.....	10	50 .76	50.57
Lamartine street.	12	836.58	69 71
Downing street.....	12	729.77	60.81
English High.....	22	2,334.41	105 97
Classical High...	16	1,450.89	90 67
Ash street...	6	408.00	68 00
Thomas street.....	12	484.73	40.00

HEATING NOTES.

We have received from the Magee Furnace Company of Boston, Mass., a very neatly printed catalogue of 40 pages, printed in colored ink and bound in paper covers of attractive design. Its pages are devoted to the Magee warm air and hot water combination heater, made in six sizes and having a hot water capacity ranging from 75 to 700 square feet of radiating surface. The opening pages are given up to the subjects of heating and ventilation, followed by an illustrated description of the construction named. One page shows Magee's Boston heater as it appears in the basement of a dwelling, indicating in a general way the arrangement of pipes and fittings. Another page shows the relative position, as they appear in the heater, of the hot water sections and disk, while a third illustration shows the various sizes of hot water sections and disks used in the Magee combination system. The water sections are placed in the fire pot 4 inches from the bottom, and each one takes the place of 2½ bricks. Each section is tapped for 1¼-inch, flow and return, although the double sections can be tapped for 2-inch if necessary. An interesting feature of this neatly arranged publication is found in the floor plans of a residence in Malden, showing the location of the heater, size of pipes and position of registers and radiators. The residence is heated with a No. 5½ warm air and hot water combination heater, four long water sections being used, attached to 425 square feet of radiating surface. The second half of the pamphlet is devoted to hot water radiators, tables giving list of sizes of Standard and National radiators, ratio of radiating surface to space heated, directions for using the Magee warm air and combination heater, tables showing sizes and prices of registers, capacity of pipes, together with a partial list of persons in various sections of the country to whom the manufacturers refer for information as to the merits of their heater. Numerous views are also given of buildings in which the company's heater is used.

The Baltimore Heating Company were incorporated recently at Baltimore, Md., with a capital stock of $5000, by John Trainor, John J. Kelly, Patrick Flannigan, Louis Becker and Duane B. Van Buren. The company will deal in stoves and other heating apparatus.

The J. H. McLain Company, Canton, Ohio, send out circulars illustrating the Canton heaters of their manufacture. This firm make an extensive line of steam and hot water heaters, the illustrations showing the Humber water heater, the Harvard water heater, Cambridge steam heater and the Yale and Sandow water heaters, all of which are illustrated in general and sectional views.

The New York Central Iron Works, Geneva, N. Y., are in receipt of a letter from the Assistant Quartermaster U. S. Army, Plattsburgh, N. Y., in which he says that he has set up under contract 29 Dunning boilers for heating officers' quarters, barracks and other public buildings at that post, and has been very much pleased with their performance.

The Gorton & Lidgerwood Company, 96 Liberty street, New York, have installed Gorton boilers in many prominent educational institutions during the past winter, and in all cases, we understand, the heaters have given excellent results. The firm report a good spring business and a favorable outlook for the future.

George W. Plastow, heating and ventilating engineer, representing Johnson & Morris, steam and hot water contractors, 239-241 South Fifth avenue, New York, is on the card presented to those who are interested in the question of heating and ventilation. Mr. Plastow recently visited a customer who gave an order for a considerable heating plant, saying: "More than 20 years ago your house heated a building for me, and the plant has been so free from annoyance and excellent in service that I remembered your house when I wanted this building heated."

A new attraction has lately been put in front of the establishment of the Crane Company, 122-130 Centre street, New York, dealers in pipe and pipe fittings. A length of 12-inch wrought iron pipe is supported by a stand made of flanges, nipples, reducers, ells and water ells, surmounted with a tee at the top of which is used an acorn for a finish. The pipe is protected by a coating of transparent varnish and the name of the concern, "Crane Company," occupies the center, while at one end is, "Pipe ¼ to 24 inches in diameter" and at the other end are the words, "All sizes cut to sketch." At the corner of their building they have a 24-inch flanged tee.

The American Boiler Company, 94 Centre street, New York, have secured Parlor 217 at the Broadway Central Hotel, at 667 Broadway, where they will receive and entertain their guests at the convention of the National Association of Master Steam and Hot Water Fitters on June 19.

"Standing on the corner of Broadway and Duane street, New York, the following large buildings in which our radiators have been used can be seen: The Scott & Bowne Building, Produce Exchange Building, Mutual Reserve Life Building, Home Life Building and the Manhattan Building, with the Sheldon Building on Nassau street just off of Broadway," was the remark of a representative of T. C. Joy & Co., manufacturers of radiators at Titusville, Pa., with an office at 48 Centre street, New York.

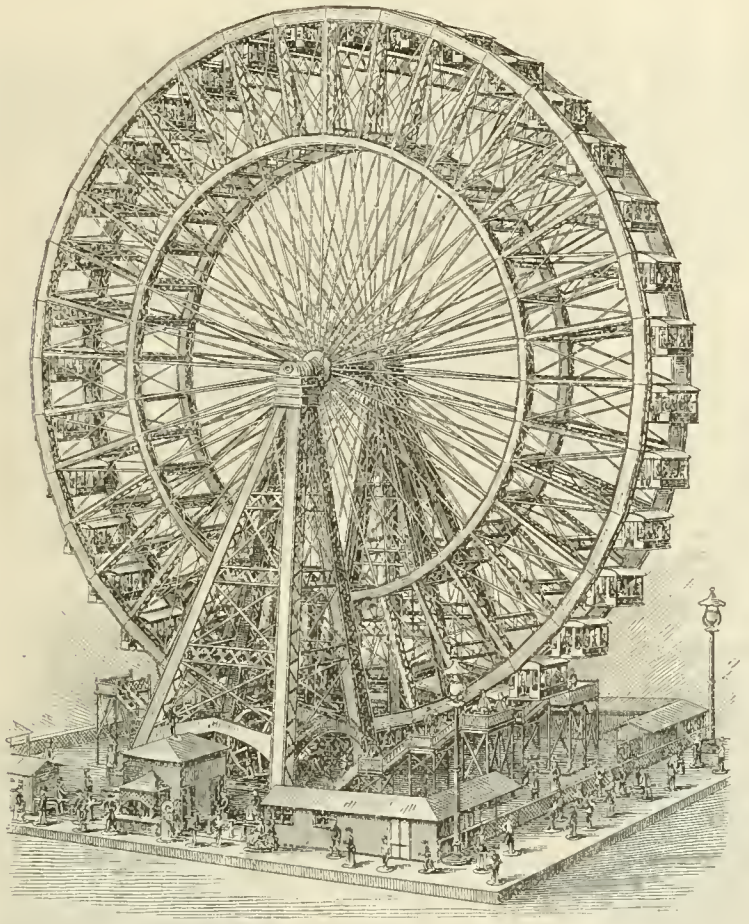
On Wednesday and Thursday of last week the New England trade were very pleasantly entertained at the opening of the new showrooms of the A. A. Griffing Iron Company, at 177-179 Fort Hill Square, Boston, Mass. Chas. A. Lathrop, the New England manager of the concern, discharged his duties as host in a most happy manner, and the many members of the trade present were unanimous in their verdict of "a very enjoyable time." The new showrooms occupy the entire first floor, 35 x 80 feet, are well lighted and particularly adapted for showing the extensive line of Bundy radiators made by this concern. The numerous styles and sizes were artistically arranged, with a background of palms and other potted plants, which, with the bright colors of the radiators, made a very handsome picture. The radiator decorations, which were done by James Croke of Boston, are particularly worthy of note, several new effects in amaranth, lilac, emerald green and aluminum bronze being shown together with all the standard bronzes and enamels. On Thursday evening a collation was served, at which there was an abundance of both eatables and drinkables. A quartet and an orchestra furnished music for the occasion.

W. H. Page of the W. H. Page Boiler Company, Norwich, Conn., was the guest of Du Bois & Darragh, 61-63 Gold street, New York City, where an agency for New York and vicinity has been established for the All Right and Volunteer steam and hot water boilers. G. H. Weymouth will represent the house in this branch of the business.

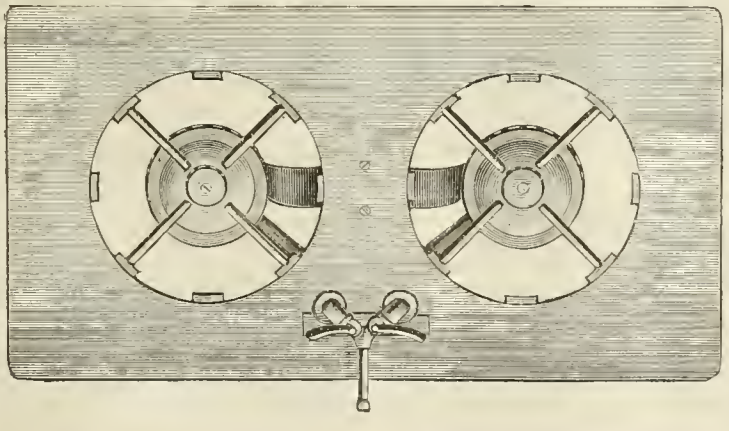
The Ferris Wheel in Tin.

We show in the accompanying engraving an unusually interesting example of the tinsmith's art. The picture, it is needless to explain, is a representation of the Ferris wheel in miniature, and we have received it, together with the following letter, from E. A. Armbruster of the Minnesota Hardware Company, St. Paul, Minn.:

I find great pleasure in reading *The Metal Worker*, which I have taken for many years. I am particularly interested in looking over the tin shop pages, in which are patterns and diagrams of various kinds of tin work. I send you herewith a photograph of an exact model of the original Ferris wheel which I have made of such scrap tin as goes to waste in the shop. The model is scaled ¼ inch to the foot of the original wheel, and is composed of 10,989 pieces of tin and wire. It is lighted up and run by electricity, there being a two-candle power incandescent lamp in each car and one on each corner as a lamp post. Each of the 36 cars is loaded with from 18 to 20 passengers. The guards and various other people, ticket offices, sheds, elevated platforms and push chairs are all cut out of tin and painted. It took about four months of my spare time, such as noons and evenings, to make it. We have rented the wheel out to various parties for exhibiting in their show windows, and at present have it in our own window.



The Ferris Wheel in Tin.



Portable Gas Appliances.—Fig. 1.—Gas Cooker.

Portable Gas Appliances.

The illustrations presented herewith show some patent portable gas appliances that are being manufactured by the New York Stove Works, Peekskill, N. Y. These appliances are specially designed for use in connection with coal stoves. Fig. 1 is a plan view of a gas cooker. It consists of a cast iron plate, to which are attached two gas burners, which are provided with separate gas cocks, one controlling each burner, and an extension nozzle, to which a hose can be attached. By simply lifting off the covers and cross piece over the fire chamber of any cooking range, the gas cooker can be set in place, the square plate enabling it to fit any stove regardless of the difference in size of the covers ordinarily found. Then a hose may be run to some convenient gas fixture and connected with the nozzle of the apparatus. This will be found specially convenient in cases where a coal fire has been used but has died out from inattention, as the gas cooker can be put in operation in a few minutes, furnishing a good hot flame for cooking, under one or two holes, as may be required. Fig. 2 shows a gas baker burner which is designed to be set in the oven and connected to some of the gas fixtures with a hose. To secure a more equal distribution of the heat a burner is placed under each end of the plate and connected to it. The food to be baked is then set on the plate the same as in an ordinary oven. In using the gas baker it is best to lift off the oven door of the stove, or if it cannot be lifted off, it should stand open. Fig. 3 shows the gas baker front, which is designed to fit on the baker and close the front of the range instead of the oven door, and is arranged with perforations, by which the oven is ventilated. The baker and front are made in three sizes, to suit different sized ovens, and the baker front is partially made of sheet iron, which allows it to be cut to fit the particular oven in which it is used. With these appliances any coal cook stove can be turned into a gas cooking apparatus in a few minutes, and all the benefits of a gas cooking apparatus derived. In addition to these appliances the company make a large variety of gas hot plates, sad iron heaters and gas cooking furniture. The management of this department of their business is in the hands of an expert, and they claim that their goods have proved highly satisfactory wherever introduced.

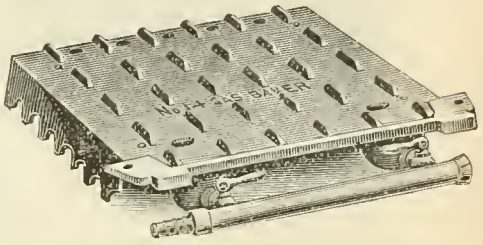


Fig. 2.—Gas Baker Burner.

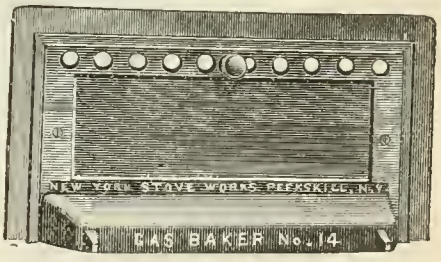
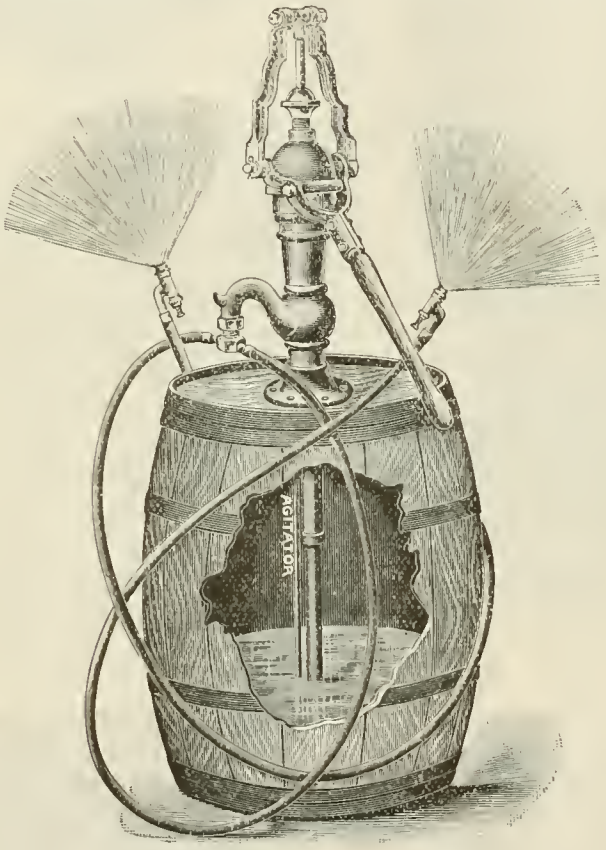


Fig. 3.—Gas Baker Front.

THE RETAIL STORE.

No. 16 Novelty Spray Pump.

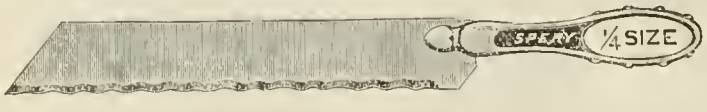
Hess, Snyder & Co., Massillon, Ohio, are offering a spray pump as shown in the accompanying cut. In construction, a heavy brass cylinder is screwed into the plunger or bottom of the pump, to make the pump short and strong. The handle can be placed in any position around the pump, which feature is referred to as an advantage. It is stated that the handle attachment which connects the handle with the plunger rod allows water to be pumped in large quantities with ease, and that the pump has a 6½-inch stroke. The agitator consists of a ¼-inch pipe which screws into the base of the pump and extends to the bottom of the barrel to keep the solution thoroughly mixed at all times. The pump is fitted with an attachment for either single or double line of hose, to which spray or solid stream tips can be connected. The pump is designed to attach on a tank or barrel, as shown in the cut. The manufacturers claim that the pump can be taken apart in five minutes, and that nothing but the best material enters into its construction.



No. 16 Novelty Spray Pump.

Spery Serrated Edged Knives.

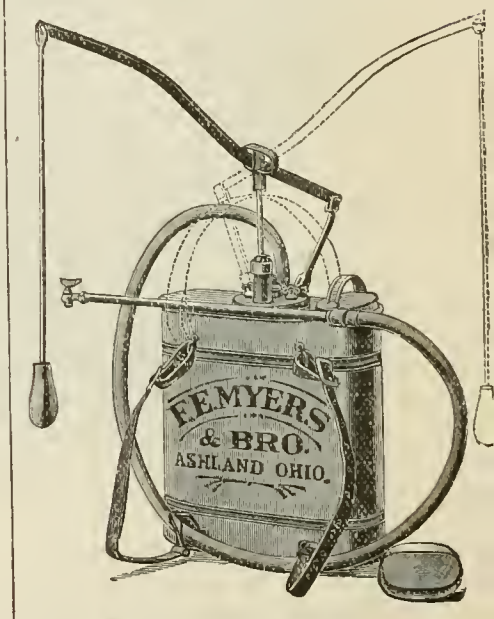
Charles F. Spery & Co., St. Louis, Mo., for whom Bronson & Near, Cleveland and New York, are sole agents, are introducing serrated edged bread, cake, paring and coring knives, as herewith shown. It is explained that the serrations in these knives are deep and shallow, short and long; the short, shallow teeth doing the principal cutting, the long, deep serrations preventing any possible clogging and tearing. In other words, it is remarked, uneven serrations do the work more easily and much smoother, upon the same principle that a serrated or saw edge knife will cut hot bread or cake better than a common knife. The knives are made with straight and curved blades, the curved blade being recommended by the makers as superior for cutting bread or cake, as the center of the blade strikes the bottom of the loaf or the top of the bread board first, making as clean and perfect a cut at the bottom of the loaf, without tearing, as at the top. The manufacturers state that the knives are made from crucible steel, finely tempered, and that they will not only retain their shape but will hold a perfect cutting edge. The knives are sold in sets, set No. 1 containing 1 each bread, cake and paring knife, straight blade; set No. 2 containing the same assortment with curved blades.



Spery Serrated Edged Knife.

The Myers Knapsack Spray Pump.

F. E. Myers & Brother, Ashland, Ohio, are introducing a knapsack sprayer, as herewith illustrated. The tank is made to hold five gallons and is fitted with removable lid and strainer. The pump is constructed of brass, so as not to be affected by the poisonous arsenites used in the various formulas for spraying. The pump has a large air chamber, ball valves, solid plunger and agitator. The point is made that the pump is so arranged that the hard work is done on the down stroke of the piston, and so that no water can drip on the operator. The pump can be removed from the can easily and is fitted with handles, so that the operator can use it with either the right or left hand, as the cut indicates. It is explained by the manufacturers that by removing the lever the sprayer can be used in the same manner as their tank spray outfit, by setting the knapsack on the ground and working the pump by hand hold. The dotted lines indicate the manner in which the strap can be snapped to the opposite side of the can in a loop, serving in this position as a bail to carry it by when using it as a tank sprayer. The sprayer is referred to as a common sense device, answering the purpose of a knapsack sprayer equipped so it can be operated with the right or left hand, and also so arranged that it may be used as a tank or can spray, thus making it competent for washing windows, buggies, and for other uses of this kind at times when it is not required as a knapsack sprayer.



The Myers Knapsack Spray Pump.

STOVE TRADE NOTES.

The Local Stove Trade.

The stove trade in New York and vicinity, as interpreted from the various terms used by the dealers to designate its condition, is between very bad and fair—the adjective "good" being seldom heard in this connection. It has been so since March, a month in which the trade in stoves reached proportions more nearly normal than for several months before. It was due, it might seem, to a renewal of manufacturing operations in many lines, based in some cases upon an assumption that the breaking up of winter would bring an end to suspended demand, and in others to the charitable disposition of the bosses. It continued for a few weeks only, until the hallucination was shattered on the one hand and bank balances on the other.

The demand which set in at the close of winter was short lived, and production necessarily so, proving that production must follow and not precede demand. The people's requirements must be greater than for years past, but their means are smaller and their confidence less.

When an epidemic of disease is on the wane there still remains some sickness and almost as much fear, the latter element continuing to disturb the equanimity of the public mind long after the danger is past. So with a commercial panic—the panicky feeling, the distrust and want of confidence remain after the cause has disappeared, and the fear created by a panic in business in 1893 is not one to be soon forgotten. The man who has been idle for months will not feel sure that his troubles are ended for good when reemployed, and will fortify himself against a similar experience all he can. The business man who managed through great efforts and the strictest economy to tide over the crisis will not be apt to plunge into extravagance. The burnt child dreads the fire, and it would take an unexpected boom quite as astounding as the panic to draw men's minds entirely away from the morbid condition into which they have fallen, and which the slow growth of returning prosperity will take months to accomplish.

That thousands of men who have been idle for a long time have obtained employment this spring there is no doubt; that they have worked for less money and followed a strict rule of economy and paid back borrowed money there is no question; that they have bought but little is also a fact, for the sale of stoves still shows a lack of orders for such goods as the masses buy. The sale of oil and gas stoves has been a disappointment to dealers as well as coal constructions, though an impression prevailed with many that trade in them would be good, and many would buy such stoves who could not afford the outlay for the high priced ranges. Collections with the wholesale stove houses have naturally been affected, as the scheme of finance followed with a large proportion of the smaller stove merchants resolves itself into paying for winter stoves out of the proceeds of spring sales of oil, gas and coal stoves, and for those from cash received for baby carriages and refrigerators, and for them from the sale of winter stoves again.

A strange freak of trade is its great unsteadiness. It is not evenly dull nor steadily fair. For one or two days it is good and everybody is busy, only to be followed by extreme dullness with nothing to do. However, business is certainly on the up grade, but the grade is steep and the going slow. The market is running low in some sizes of many articles manufactured of metal, an uneven depletion of stocks that leaves too much on hand in the aggregate to warrant a resumption of factory operations and so little of ready selling sizes that sacrifice in price is not necessary or wise. SIFTER.

Estate Oak Air Tight Radiator.

F. & L. Kahn & Brothers of Hamilton, Ohio, have placed upon the market a handsomely decorated heater, which is known as the Estate Oak air tight radiator. This consists essentially of an oak stove located within a perforated jacket. The base, instead of being composed of the usual three, four or five pieces, having numerous joints, is made in one piece with only 52 lineal inches of joint space, limited exclusively to the ash pit door and registers. The inner body is corrugated for the purpose of providing largely increased radiating surface and immunity from cracks and wear. The stove is mounted on legs in the usual way, but they are so arranged with respect to the extreme bottom that base strips are attached to cover all without the use of bolts. There are provided in a very clever manner circulating ducts for the passage of air between the inner body and the envelope or jacket from the extreme bottom to the top. The draft registers, instead of sliding, are made in the form of a screw with circulating cap and handle at one end, which offer opportunity for close grinding and adjustment. The stoves, although intended chiefly for use in soft coal regions, have been adapted and are claimed to possess all the requirements of successful hard coal burners. The magazine is jointless and made in one piece to prevent leakage. The manufacturers state that fire can be kept continuously from one charge of fuel of any kind as long as 50 to 60 hours, depending upon the quality of the fuel and the character of the chimney. The stoves are offered at a moderate price, on which account large sales are anticipated. We understand that the makers have already secured four patents covering the improvements and several more applications for patents are now pending.

William Resor & Co.

of Cincinnati, Ohio, favor us with a copy of an exceedingly neat and tastefully printed price-list and catalogue which they have issued relative to their leading specialties. Since the last edition was distributed to the trade the makers have added a number of new styles and sizes to their list, covering cook stoves, ranges and heaters. Among the latter may be mentioned the Royal Monitor six-hole cook stove, intended for burning wood as a fuel. Its constructive features include detachable end top shelf, ventilated oven, large smooth swing hearth plate, patent oven door opener, portable reservoir, which is placed over the two boiler holes in front of the smoke pipe, and an arrangement of the front swing fender by which the overdraft to the fire box when starting the fire is prevented. The Royal Monitor is made in two sizes and several varieties. Another novelty which the company have recently introduced to the trade is the Electric Monitor six-hole range for using coal. This stove has extra large water front, heavy fire box linings, cut top and bottom oven plates, patent oven door opener, large sheet flues, ventilated oven and shaking and dumping grate. It is made in two sizes and presents a substantial appearance. The ornamentation is effective, the treatment of the oven door being rather out of the ordinary. Another construction to which special attention is invited is the Monitor base burner for hard coal. This is made in three sizes, has large magazine, made in sections, heavy fire pot, duplex grate, capacious ash pan and tea kettle attachment. The nickel parts are so ventilated that they will not discolor, and the top ornament is a handsome combination of polished brass and nickel with enameled base.

The upper section of the stove is so constructed that there is formed between the nickel work and the main plates of the stove a large hot air chamber, this being connected at the back with the circulating flues, which extend to the floor. The catalogue consists of nearly 150 pages of letterpress and presents illustrations of an extensive assortment of Monitor stoves, ranges and heaters.

THE BUSINESS recently owned by the Lake Shore Foundry Company of Chicago and operated under the name of Metzner & Co. has been sold to the Manufacturers' Stove Repair Company. The new company are enjoying a large

trade and are organized on a substantial financial basis. The Lake Shore Foundry Company guarantee all bills that may be contracted by them until further notice.

New Chicago Warehouse of Detroit Stove Works.

The Detroit Stove Works have just completed a fine warehouse in Chicago, located at Nos. 2921 to 2929 La Salle street, between Twenty-ninth and Thirtieth streets. The rear abuts on the Chicago, Rock Island & Pacific Railroad, from which the stove company have a private siding which runs in on their own ground immediately alongside their building. In acquiring this site the company purchased more ground than is covered by the warehouse, with a view to possible enlargements in the future. The size of the building is 100 x 105 feet, five stories high, not including the basement. Being built by the company for their own exclusive use, the warehouse was designed to meet the special requirements of the stove trade. The arrangements are, therefore, of a special character, and the details are peculiarly worthy of extended notice.

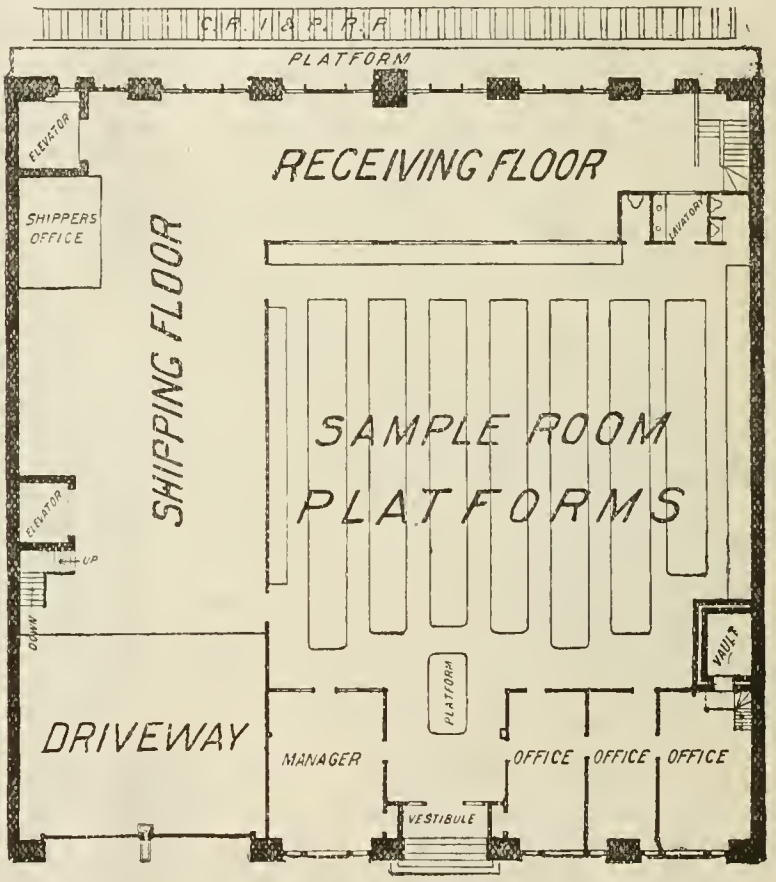
The first floor, a plan of which is shown in the accompanying illustration, is laid out for offices, sample room and shipping room. The shipping room has not been sacrificed for the benefit of the offices, but has received proper attention. It extends in the shape of an L from the La Salle street front around the whole rear of the building. In the rear it faces the company's railroad track, along which a platform extends on a level with the floor of a freight car. There are four doors opening on the platform, and four cars can be handled at one time. It has been shown by actual test that a car can be loaded or unloaded here in half an hour. The shipping floor is large enough to set out from seven to eight carloads of stoves with ease. At the La Salle street end of the shipping room is a team entrance for city business which is capable of accommodating three teams at one time. Stoves can be loaded and unloaded here under cover, without regard to the weather. Two elevators are in use. One is a power elevator of large size which will carry a full team load. The other is a hand elevator, particularly convenient for lowering stoves from the upper stories for small shipments.

The sample room, on the same floor, is very commodious, nicely arranged and well lighted, having windows on three sides. The platforms have a hardwood finish, are varnished and have round corners, adding much to the appearance of the room. The steel range samples are placed in a row across the back part of the room on a platform slightly higher than the others, making a very fine display. The offices are in front. The manager's office is on one side of the main entrance and the general offices are on the opposite side. These offices are handsomely appointed, the manager's room being wainscoted in panels and furnished with a carved mantel, while the general offices are divided into several apartments by oak and plate glass partitions. A feature of the general offices is a large two story vault for storing valuable papers.

The basement has a high ceiling and is unusually light. In one corner is the engine room, containing a 20 horse-power Otto gas engine, which operates the power elevator. It is run with natural gas, but can be connected with the manufactured gas supply whenever necessary. A large part of the basement is occupied by the stove repair department, containing between 600 and 700 casting bins. Considerable room is left for the storage of stoves.

The upper floors are used wholly for storage purposes. On the second floor ranges and cook stoves are carried. The third floor is exclusively used for high grade heating stoves. All the space on the fourth floor is given up to Jewel oak stoves. The top floor is used for medium priced and lower grade heating stoves.

The building is pronounced by architects and builders as one of the very best warehouses so far erected in Chicago. It is a most substantial structure, having unusually heavy brick walls with steel girders, cast iron posts and 6 x 12 inch joists on every floor and



New Chicago Warehouse of Detroit Stove Works—Plan of First Floor.

even supporting the roof. All the floors are of hard wood. Every story is well lighted, so that stoves can be inspected in the middle of the building as easily as at the ends. The front is more ornamental than the regulation warehouse. It is faced with handsome dark colored pressed brick. The main entrance is recessed, with heavy iron gates guarding the approach. Taken throughout the building reflects great credit on owners and designers.

THE DETROIT STOVE WORKS exhibit on their sample room floor at 2921 to 2929 La Salle street, Chicago, a superb line of steel ranges. These ranges are more profusely ornamented than has generally been the custom, as a demand has sprung up for variations from the rigidly straight lines of such goods. The fronts are made of cast iron, molded with relief work, with ornamental columns at the corners giving apparent support to the top. The high shelf is built with the sides running in graceful curves, with nickeled edges. The interior construction is in keeping with the imposing exterior. Oven doors are balanced. Oven bottoms are not made in one piece, but are sectional, consisting of four pieces of flanged sheet steel, to guard against buckling.

The Keeley Stove Company

of Columbia, Pa., have just issued a 148 page catalogue descriptive of their line of goods. A leading feature of the book is the variety of stoves appearing this season for the first time. The opening pages are devoted to a presentation announcement, information in regard to ordering stove repairs, with price-list of repairs and terms and special notices. The catalogue proper commences with illustrated descriptions of the Columbian Newport and Newport ranges which are followed by the Columbian Choice, a new six-hole range in six sizes, suitable for hard or soft coal, with side ash pit, bed plate in two parts, tea shelf, reservoir, cozy high closet and heating attachment. The new Cappello is described as a new sheet flue range, in six sizes, for hard or soft coal or wood. Then follow more ranges, including the Columbian Choice, 1893, in two styles, and the New Cappello, 1893, also in two styles; Columbian Plato, Columbian Star, Columbian Charm, Columbian Dandy and Daisy, Columbian Gem, Vim, Columbian Bessie and Pet. Next in order are cook stoves, the line covering the Regulator, Golden Grain, Columbian Dora, Columbian Alliance, Miner's Friend and Dolly. About 38 pages cover heating stoves, prominence being given to the Columbian Joy, 1894 pattern, a reversible flue base burning square parlor stove, in five sizes, embodying the ventiduct system of circulation and radiation; the magazine is fitted without

holes or screws, and the whole stove may be easily dressed by a dealer without screws. It has cold air caps to keep the nickeled under body from tarnishing, and is supplied with center draw or triplex grates which can be removed or placed in position through the ash door. The Columbian Aid, Columbian Cadet, and Alpine stoves are also presented, followed by the Columbian Sun, a new surface burner, made in five sizes, and the Columbian Queen, a new return flue sheet iron surface burner of medium price with nickeled skirt and foot rails. Other new stoves shown are the Morning Light, a direct draft sheet iron single heater, and the Morning Light, a double heater in five sizes. The remaining heating stoves shown comprise the Grip, New Morning Light, Nobby, Active and Columbian Ulster. In open heaters are noticed the Luxury, Columbian Chime, Columbian Prize and Pearl. The Columbian Ulster, a portable heater, is shown remodeled, and the Columbian Crown is described as a new departure in stove construction. It is made to operate upon the ventiduct system, thus heating by circulation and radiation. The usual line of cylinder, laundry and wood stoves occupies some half dozen pages, followed by Columbian Vulcan and Columbian Banner furnaces, which have been redressed for the coming season's trade. A full page engraving shows the interior of a house heated with a Columbian Vulcan, with its hot water combination heating an upper room. One, two and three burner gas cooking stoves, lately put on the market by the company, are also illustrated, as well as a new gas heater for small rooms. The remainder of the book is taken up with utensils, tools and supplies and descriptive lists of repairs.

The company have this season adopted for their ranges interchangeable covers and centers, so that one size will suit all ranges. The centers are in two pieces, to prevent warping or twisting. Another improvement is in the style of shakers used. One shaker now will fit all stoves and ranges having the triplex grate. The shaker is to be known as the Columbian Daisy, and has a stop on the socket which prevents withdrawal until the grate is in proper position.

"The Blue Book of the Stove Trade"

is the title of a substantially bound volume of over 450 pages which is published by the American Stove Association of New York and Chicago. As indicated by its title it is a "blue book," being bound in stiff board covers of a shade of deep blue. The paper is of good quality and the edges are finished in bright red, giving to the volume a very attractive appearance. The work, which has just been issued from the press, is "a book of special credit reference for the use of all who sell to the stove trade of the United States." Probably the most conspicuous feature is the system of three ratings indicating the business investment, the total responsibility and the paying habits of the concerns rated. The preface states that the volume contains the names and ratings of nearly 40,000 merchants who sell stoves. From the prospectus which accompanies the work we learn that the purposes of the American Stove Association are "to furnish more accurate, prompt and reliable credit information than is obtainable from present existing sources; to protect prompt paying and responsible stove dealers by restricting to proper limits the credit of their incompetent, dishonest or otherwise unworthy competitors; to provide a means for the prompt collection of past due notes and accounts by more rapid and satisfactory methods than at present prevail, and the correction of the many petty abuses to which stove manufacturers are subjected at the hands of unscrupulous stove buyers." The manager of the association is Charles E. Brackett, Manhattan Building, Chicago, Ill. The New York office of the association is at 150 Canal street.

ODD PLATES.

THE MICHIGAN STOVE COMPANY, Detroit, Mich., are constantly extending the territory in which their goods are sold, and now and then receive orders from parts of the world where Garland stoves have never before been placed. During the past week the company received an order for two Garland stoves for shipment to Calcutta, India, and accompanying the order was the following explanation: "This order is quite a novelty, all of the parts considered. The stoves are to go from Calcutta 1000 miles northeast to Naga Hills, in Assam. For the last 500 miles of the journey they will have to be carried on the backs of natives. These stoves go 500 miles beyond where any stove has ever been sent, and it will take nearly a year for them to reach their destination."

The Metal Worker last week had the pleasure of a call from J. W. Lane, Newton, N. J., whose reminiscences about the early days of the stove and tin trade in New York City were exceedingly entertaining. Mr. Lane knew many of the old time Water and Beekman street merchants from whom he bought goods when he began business in Newton.

THE CANFIELD STOVE COMPANY, Rondout, N. Y., publish in connection with their advertisement in a recent issue of the Kingston *Daily Freeman* a series of verses entitled "A Grandmother's Surprise." The verses tell of the time when Kingston was a wilderness and of the old Dutch oven in which the grandmother baked her bread. They also tell of her first cook stove and in later years of her opinion of the first range she saw. Now, when she goes to visit her grandchild and watches the operation of a New Process vapor stove, her surprise is unbounded, and

> She hardly thinks it can be true
> Of all the work this stove can do.

THE STOVE PLANT of the Bussey & McLeod Company, at Troy, N. Y., will resume operations June 1, after a shut down which has lasted a number of weeks. The works will probably start off by giving employment to 250 men.

ABOUT A YEAR SINCE Rathbone, Sard & Co. of Albany, N. Y., introduced the Acorn radiator for coal to the trade as a new departure. They believed that the vast number of people who use soft coal as a fuel were not satisfied to be confined to the ordinary oak stove as their only choice for heating purposes; also that a more attractive stove, having the advantages of the best oak stoves in holding fire, would find a ready demand. Their anticipations were realized and many thousands were purchased. The Acorn radiator is practically an air tight oak stove surrounded by an ornamental cast jacket. It has the advantage of the intense radiation of heat from the sheet steel body, combined with the circulating power obtained through the double walls which are open from base to top, producing a strong current of heated air. The radiator can be mounted air tight, and we understand tests have proven its power to keep fire 48 hours with one hod of soft coal. A feature is that the outside jacket does not become discolored by heat. The manufacturers have issued a handsome circular illustrating the construction.

THE PHILLIPS GAS STOVE WORKS of 92 East Eighth street, Cincinnati, Ohio, are directing the attention of the trade to their line of gas ranges by means of a very neatly printed 24 page pamphlet, bound in colored paper covers. The goods are made under the name "Phillips," and are offered in a variety of sizes and styles. The top surface is provided with four boiling burners, one being double, the other single, while the oven is heated by means of two powerful burners with pilot light attachment. The baking oven is jacketed and has the company's combination asbestos and cast iron bottom. The oven is fitted with an automatic drop shelf operated by the opening and closing of the doors. The broiling and roasting oven is provided with a tin drip pan and pan grate. The burners used are operated by means of the manufacturers' improved cone seated valves. One form of the Phillips gas range is provided with water heating attachment, the heater being of brass and tested to 200 pounds pressure. It has two burners with separate valves and a pilot light attachment. The top plate of the heater has two griddle holes over which cooking can be done, while the water heater is in use. The manufacturers state that the heater can be attached to heaters Nos. 36 and 25. In addition to the line of gas ranges the pamphlet gives attention to the Gimper hot plate, the Phillips gas circulating water heater and the Phillips hot plates. Full directions are also presented for operating the Phillips gas range and reasons why these goods are the best.

"THE CHEERY WOOD FIRE" is the name of an attractive pamphlet of nearly 50 pages which reaches us from William Resor & Co. of Cincinnati, Ohio. The title indicates to some extent the contents of the pamphlet, although primarily the booklet is intended to introduce the company's new base heating hot air circulating wood parlor stove, to the planning and construction of which they have given a great deal of time and careful and extended study. The Monitor parlor base heater, for wood, is illustrated and described at considerable length, following which we find a large number of letters containing the opinions of some of those who have used or handled this stove.

GEORGE B. COBB & CO., 155 West 125th street, New York, are issuing a circular with the suggestion "Cook with gas." It shows how to save $4.57 per month according to their reckoning. One dollar is used for wood for kindling fires and $6 for a ton of coal a month, amounting to $7. By the use of a gas range the gas bill amounts to $2.43, leaving the above difference in favor of gas. This is a novel appeal in favor of the benefits of cooking with gas, and the balance of the circular is devoted to describing the comforts derived from the use of gas fuel and the different methods of cooking and performing kitchen service with it. A final sentence is, "We have on exhibition in our salesroom a large assortment of gas

stoves and ranges." They also make a specialty of the Welsbach light for reading, writing and sewing.

THE PLANT of the Coldwater Oil Stove Company, at Coldwater, Mich., is the subject of an interesting article which appears in a recent issue of one of the local papers. From it we learn that early in the winter the superintendent leased what is known as the Titus Foundry, in which to make the castings for the stoves, but finding the capacity inadequate for the purpose at once made improvements. A new cupola was put in, the old molding room torn down, and a new one 40 x 120 feet erected, in which 35 molders turn out daily the castings for 80 stoves. The nickel plating department is contained in a room 22 x 80 feet, giving employment to ten hands, under the management of William Mason. The mounting, packing and shipping are done in a three-story and basement building covering an area 40 x 100 feet. In the rear of the main building is another structure, 30 x 60 feet, where the oil tanks of the stoves are tested. The article states that thus far in the present year orders have been received for 6000 stoves from the Western trade alone, and it is expected before another winter the sales will aggregate 15,000 stoves.

CHARLES F. BARTLETT, Tenth and Filbert streets, Philadelphia, Pa., is sending out an eight-page circular of the London Café wrought steel gas range. The ranges are made with baking, broiling, roasting and warming ovens, and with burners for cooking on top of the range. One of the cuts shows the range with smoke canopy, hot water boiler and plumbing work as recently installed in a handsome residence in Philadelphia. The circular also shows Perfection gas grates and gas heaters.

S. T. PECKHAM, general sales manager of the Palermo Mica Company of 27 Peck Slip, New York, favors us with a sample of a unique business card which is employed by the concern that he represents. The card consists of a sheet of mica 2¾ x 6 inches in size, almost as clear as crystal, upon which in silver letters appears a request, addressed to stove manufacturers, not to forget the fact that by placing their orders for mica for the coming season with the Palermo Mica Company they are likely to save money for their customers.

THE CRAIG-REYNOLDS FOUNDRY COMPANY, Dayton, Ohio, are meeting with a very gratifying demand for their Triumph series of warm air furnaces. These goods embody a number of novel features and are proving so popular with the trade that the manufacturers are in daily receipt of flattering testimonials relative to the merits of the line.

THE LEXINGTON (KY.) STOVE COMPANY, it is reported, are building an extensive addition to their foundry.

ACCORDING to recent Western advices the works of the Thatcher Furnace Company at Argentine, Kan., were recently sold to Homer Smith of Topeka, and we understand it is the intention to incorporate a company with $100,000 capital for the purpose of pushing the business.

THE PORTSMOUTH STOVE & RANGE COMPANY, Portsmouth, Ohio, write us under recent date as follows: "So far this year we have run full every day, except Sunday, and have not taken a single holiday, and were even so wicked as to run the day John Robinson's circus was in town." The Model wrought steel range has had several new and important improvements added recently and the demand for it is such as to readily indicate the rapidly increasing popularity of this branch of their productions.

A PRESS DISPATCH from Fulton, Ill., published in a recent issue of the Chicago *Inter-Ocean*, states that the Mississippi Valley Stove Company have discovered a valuable bank of molding sand 15 miles east of Fulton. The bank is said to be worth thousands of dollars to the company, for the reason that they have hitherto been compelled to ship sand from the East at high freight rates. The sand is pronounced to be superior to any the company have ever used.

THE INDIANAPOLIS STOVE COMPANY of Indianapolis, Ind., have filed a notice of the reduction of their capital stock from $50,000 to $30,000.

THE PENINSULAR STOVE COMPANY, Detroit, send us a sample of their new trade-mark stickers, for which, we understand, there is a great demand among their customers. The stickers are in two sizes and of various colors. Dealers handling Peninsular goods consider the stickers excellent advertising matter, and agents are supplied with them in such quantities as may be required.

THE HOT AIR FURNACES made by the Kernan Furnace Company, Utica, N. Y., will be used in heating the new school building at West Winfield, N. Y.

PERRY STOVE COMPANY, 242 Water street, New York, are offering the trade a new double lamp stove which they call the Shoo Fly. It is furnished with either two or four hole extension top. They are also showing an extension top to be used in connection with their No. 2 Fire Fly gas hot plate, which practically gives another cooking hole.

THE FULLER-WARREN COMPANY are busy putting their new quarters in proper shape at 147 and 149 Lake street, Chicago. A great deal of remodeling was needed to adapt the building to the special requirements of the stove and furnace business. When everything is completed, however, they will be in very much better shape for handling their trade than at their former location. They now have three floors, each 40 x 165 feet, more than doubling their facilities. Their building being situated on the south side of the street, they have the advantage of north light in their offices and drafting room, which are in the front part of the sample floor. These are neatly fitted up with oak and plate glass half partitions. The sample room is well lighted by large windows in the rear as well as from the front. They have an independent elevator, instead of sharing in the use of one with other tenants. The floor above the sample room and offices is used for castings, and the top floor is fitted up as a furnace shop. Their facilities for the transaction of business are now of the best character, enabling them to meet all the requirements of their Chicago trade. They have a large alley in the rear for shipping, which is an important advantage over the cramped alley at their old place of business. The Fuller & Warren Warming & Ventilating Company have their offices here also.

THE DETROIT STOVE WORKS have issued a very tasteful illustrated circular announcing the removal of the Chicago branch to the new warehouse, 2921 to 2929 La Salle street, Chicago. An opening and reception took place on the 25th inst. from 9 a.m. to 10 p.m.

The Kind Hearted Farmer.

The prevailing dullness in the stove trade is keenly felt by the average traveling salesmen, and we sometimes hear of them resorting to queer expedients to increase sales and keep down expenses. The boys on the New England circuit are telling a story which has for its hero S. H. Plumb, who represents the Stamford Foundry Company of Stamford, Conn. It appears that Mr. Plumb found himself one afternoon recently in New Hartford, Conn., and having finished his business desired to go to Winsted, which is distant some eight miles. The train he intended to take was found upon inquiry to have been discontinued, so there was the prospect of remaining in the town for five or six weary hours. This was too much for the energetic spirit of our friend Plumb and he started off on foot for Winsted, carrying without effort a nice little order for Stamford ranges. The day was warm and the road dusty, and our traveler, after having covered four or five miles, was overtaken by a farmer with a team who invited him to ride, saying that he was going to Riverton, but he could carry Mr. Plumb along several miles and drop him at a point very near to Winsted. Footsore and by this time very dry and dusty, the stove man gratefully accepted the offer and proceeded along the road at a jog trot in more comfortable frame of mind. Cigars were lighted, and by way of showing his appreciation of the farmer's kindness, Plumb told him some late stories, including one which refers to the heating business and runs as follows:

Last fall, at the conclusion of the regular Saturday service in a nameless synagogue, the rabbi announced that about 40 tons of coal would be required to heat the church during the winter, and passed through the congregation with a box soliciting contributions. Almost every one dropped in something, save Mr. Isaacs, who winked in a knowing manner and refused to contribute. When the offering was counted the sum was found inadequate and the box was passed again. This time, also, Mr. Isaacs refused to give anything, and winked even more knowingly at the collector. The next day the rabbi met his parishioner and asked him why he refused to contribute toward buying the coal and why he winked in such a peculiar manner. Whereupon Mr. Isaacs lifted his hands, with palms extended, and said: "Say nottings. I'm onto you; the church is heated by steam."

Carried away by his own eloquence and the appreciation of his auditor, Mr. Plumb reached the confines of Riverton almost before he realized it, and then, thanking his benefactor, clambered down and set out on the road to Winsted, being assured that a comparatively short walk would carry him to his destination. He traveled on and on, covering perhaps 4 miles before he reached the end of his journey. Arriving at the hotel, he sat down to rest and commune with himself and incidentally to figure out just how much of a lift the countryman had given him. With the aid of a map and the assistance of the hotel clerk it was ascertained that he had been carried by the friendly farmer just 2½ miles off his regular track, and had covered exactly 1⅛ miles further than the air line distance between New Hartford and Winsted.

TRADE REPORT.

The Iron Market.

From Cleveland comes the news that lately quite a considerable quantity of Mesaba Ore from the Rockefeller interests has been placed at old figures, and that now sellers generally ask a slight advance.

The question of future increased cost is attracting growing attention among Western producers, and it is coupled with the fear that further labor troubles may develop. There is some uneasiness concerning the Lake Ore miners, and considerable uncertainty about the result of the coming negotiations between the Amalgamated Association and the union mills. As our correspondent in Cleveland telegraphs, the scales to be presented by the former will be a repetition of last year's demands. If that proves to be true there will be trouble.

An increasing number of mills have been forced into idleness through the Coal and Coke strikes, and the floods have interfered with the operations of others.

The feeling is growing general that active operations will soon begin in the Connellsville Coke region. Two of the Pittsburgh blast furnaces are getting ready to start next week. There is a growing conviction, too, that the decisive moment is coming in the Coal strike, and that work will be resumed at no distant date. But even if operations are again started it will take some time before the Coal trade settles down into its regular grooves.

No movement upward has taken place in Foundry Iron, although the growing scarcity of Southern Pig is bringing the situation very close to an actual advance.

Pig Iron.—The expected advance of freights from the Lehigh Valley to New England points, which is now $1.75, has not alone stimulated shipments but has also led to quite a number of sales, among them some to cover requirements for quite a considerable period. There is more inquiry also from the territory north of Albany, which has been so largely controlled by the Buffalo and valley furnaces, as the result of the stoppages of these furnaces through the Coke strike. Prices have not been affected, however, although Eastern Pennsylvania producers are more conservative in the sales for delivery during the second half of the year. We quote standard brands $12.50 @ $13 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9 75 @ $10.25.

The two prominent features of the week in the Philadelphia Pig Iron market have been a scarcity in low grade Irons and a lighter demand for other descriptions. At $10 @ $10.25, delivered, a good deal of Iron would be taken; at $10.50 and upward buyers begin to pick and choose. As a rule holders claim to have firmer ideas, and while there is plenty of Iron at $10.50 @ $10.75 for Mill and Pipe purposes, it is not easy to force concessions, and the same may be said of No. 2 X at $11.50 @ $11.75, although, as usual, chance lots at less money are met with once in a while. General quotations for Philadelphia and equivalent points are about as follows:

Standard No. 1 Foundry X	$12.50 @ $12.75
Standard No. 2 Foundry X	11.25 @ 11.75
No. 2 Plain	10.75 @ 11.00
No. 1 Soft	11.50 @ 11.75
No. 2 Soft	10.75 @ 11.00

Our Chicago advices indicate an improvement in business. Better buying has recently developed, Local Iron being in very good demand, comparatively speaking. Shipping instructions are reported to be coming in at a lively rate on old contracts and new orders have been entered quite freely during the week. Negotiations are now pending for considerable quantities which are expected to be closed soon and will make the coming week a good one. Agents of Southern companies generally report business quiet, but it is known that orders ranging from 200 to 400 tons each have been placed and that one house in this way sold about 1500 tons since last report. Southern Soft Irons are now very scarce and the Silvery grade is practically out of the market. Foundries are running short of Coke, but every effort is being made to have them supplied and it is not expected that they will suffer seriously before the Coke strike ends. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @ $15.50
Local Coke Foundry, No. 1	11.25 @ 11.50
Local Coke Foundry, No. 2	10.50 @ 11.00
Local Coke Foundry, No. 3	10.00 @ 10.50
Local Scotch	11.50 @ 11.75
Ohio Strong Softeners No. 1	12.60 @ 13.50
Southern Silvery, No. 1	..... @ 11.50
Southern Silvery, No. 2	..... @ 11.00
Southern Coke, No. 2	10.00 @ 10.35
Southern Coke, No. 3	9.75 @ 10.00
Southern, No. 1, Soft	10.25 @ 10.50
Southern, No. 2, Soft	10.00 @ 10.25
Tennessee Charcoal, No. 1	15.00 @ 15.50
Tennessee Charcoal, No. 2	14.50 @ 15.00
Alabama Car Wheel	17.85 @ 18.00
Jackson County Silvery	15.00 @ 16.00
Other Ohio Silvery	12.50 @ 13.00

The Pig Iron market in Cincinnati is reported as showing a stronger undertone. There has bren more demand for Iron than can be readily supplied, and rather more than the usual proportion of Southern Iron selling, although the quantity is not large. There have been some small orders from the East, but the distribution of Iron in that district has been fairly liberal, considering the moderate quantity available. The main consumers of Irod are the Agricultural works, the Stove works and the Cast Pipe works, but the jobbing foundries in the aggregate are melting considerable Pig Iron, but not much in any individual instance. The Coal strike dominates the whole situation and greatly restricts trade. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke, No. 1	$10.25 @ $10.50
Southern Coke, No. 2	9.25 @ 9.50
Southern Coke, No. 3	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.00 @ 14.50
Lake Superior Coke, No. 1	12.50 @ 13.00
Lake Superior Coke, No. 2	11.50 @ 12.00
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.00 @ 13.50
Tennessee Charcoal, No. 2	12.00 @ 12.50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable	16.25 @ 16.75

A strong feeling prevails in the St. Louis Pig Iron market. Stocks have been allowed to run down to a point which will take only a moderate demand to clean up entirely, and as a number of furnaces have closed down the conditions are ripe for a steady improvement in prices. Quotations have been advanced 25¢ ℔ ton and offers for future delivery are not being sought after. Sales during the week show decided improvement over the preceding week, and the market is in better shape than it has been for months. Quotations as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$11.00 @ $11.25
Southern Coke, No. 2 Foundry	10.00 @ 10.25
Southern Coke, No. 3 Foundry	9.75 @ 10.00
Southern Car Wheel	17.00 @ 18.00
Lake Superior Car Wheel	16.25 @ 16.50
Ohio Softeners	14.25 @ 14.50

Metal Market.

Pig Tin.—Prices have been well maintained, notwithstanding lower London quotations and ample arrivals. The drop in the market which occurred toward the close of last week was succeeded in the early days of the current week by a recovery to about 20¢, net cash, for 5-ton and larger lots, small quantities of Straits Pig from store being quoted at 21¢ @ 21¼¢. There has been, however, no sign of a broader buying interest, and it is very doubtful if the average amount of Tin has been taken up by consumers and jobbers thus far this month. The arrivals since the 1st inst. aggregate 1305 tons, 560 tons of which have come in during the past few days.

Copper.—Home trade demand is extremely commonplace, purchases being on the most moderate scale, and the export outlet smaller and even poor. Supplies are said to be liberal, though not excessive. Prices, consequently, maintain about their former level, although rumors are current of substantial offerings at lower figures than are generally quoted. For small lots of Lake Ingot dealers ask 10¼¢ ℔ lb.

Sheet Copper.—No improvement is noted in the demand for manufactured Copper. Orders continue to be on a very conservative scale, while inquiries do not show any noteworthy increase. Prices are nominally maintained in accordance with the list, but concessions on desirable orders are not unknown.

Pig Lead.—Prices in the wholesale market have been exceptionally low this week, and the market generally has a very soft appearance. Consumers are very indifferent buyers, and business has been quite tame, with no immediately favorable outlook either in Pig or manufactured Lead. Jobbers ask 3¾¢ @ 4¢ ℔ lb for moderate quantities of American Pig, the bulk of business done favoring the lower figure.

Spelter.—Extremely low prices fail to stimulate business on home trade ac-

count. Purchases by Eastern consumers are on a very moderate scale, and offerings are entirely adequate to the present limited requirements. Jobbers' price for common Western Spelter is nominally 4¼¢ ℔ lb, but as low as 4¢ has been lately paid for small lots from store.

Antimony. — Business is fair and sufficient to keep jobbing prices steady at about 10¼¢ for Cookson's and 10¢ for Hallett's.

Nickel. — Prices are variable, with 45¢ @ 50¢ apparently a fair range on ordinary jobbing quantities.

Aluminum.—Manufacturers of Aluminum have issued a revised price list, as noted in another column. The following are current quotations: No. 1 Aluminum, over 98 % pure, 65¢ ℔ lb in small lots; 63¢ ℔ lb in 100-lb lots; 60¢ ℔ lb in ton lots; No. 2 grade, over 94 % pure, 60¢ ℔ lb in small lots; 55¢ ℔ lb in 100 lb lots, and 50¢ ℔ lb in ton lots.

Tin Plate.—The early portion of the week developed more business in Plates for both prompt and future delivery. Some substantial orders were placed by can makers, apparently to meet unexpected requirements, as the canning business is reported to have received quite a fillip on account of the fine, warm weather that prevailed in the first half of this month. The demand from the roofing trade, too, exhibited more life. Yet, in face of light stocks and scarcity in several lines of Plates, low prices continue to rule on business involving either spot goods or forward shipments, and evidence is wanting of any decided improvement in the tone of the market. The demand slacked off considerably toward the close of the week and relapsed into comparative dullness. Still there is enough of small business going around to keep the trade alive, although it is hardly up to the average for the season of the year. In the West a scarcity of Roofing Plates is noted, and it is reported that some of the Eastern Tin Plate manufacturers and dealers have lately received orders for large shipments to the West which have enabled them to clear out entire stocks of domestic Ternes. The fact that these Plates are nowhere over abundant seems to bear out this report.

A special London cable dispatch to *The Iron Age*, dated May 24, reports on the British market as follows: Tin Plate market is somewhat firmer, but divergent views of buyers and sellers on values hamper business. There is more inclination to contract for forward deliveries and buyers offer better rates than were current a short time ago. Inquiry from Canada is especially good, owing partly to reduction in ocean freight rates. Bessemer Cokes are about 1½ pence and ternes about 6 pence dearer. Swansea quotations are as follows:

Bessemer Cokes, 14 x 20	9/10½	@ 10/1½
Siemens Cokes, 14 x 20	...10/4½	@ 10/6
Ternes, double box	...18/3	@ ..
Charcoals	...11/	@ 13/

Sheet Iron.—Offerings of both Galvanized and Black Iron are said to be more limited, in view of a prospective restriction of output, owing to fuel scarcity. Galvanized Iron makers are feeling for better prices, and there is talk of an advance in rates in the near future. The consumptive demand continues, nevertheless, far less than the average for the present season, with no immediate prospect of expansion. Black Iron, also, inclines to stiffen, but stocks in dealers' hands are ample for the current rate of consumption. Black Plates for tinning are becoming quite scarce, and the mills producing this material are reported to be pushed to the utmost of their capacity to meet orders. The scarcity in Black Plates has already resulted in the partial or entire closing down of some of the Eastern Tin Plate works. Stocks of imported Black Plates are also down to a very low ebb, and it is commonly reported that they cannot be replenished to any extent within, at least, six weeks from now.

Chicago Report.

Scrap.—Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	...
Sheet Iron and Hoops	2.00	...
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5¼¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—This trade shows a decided change. Local shippers are very busy. They are not only having a good demand on account of the Soft Coal famine, but are also making heavy shipments to points in the West before freight rates advance. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5 25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6.75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

BLACK FLAG STOVE POLISH COMPANY, Syracuse, N. Y., advise us that business has been better than they expected, the company not having shut down at all this winter or spring.

THE NEW YORK OFFICE of the McDaniel & Harvey Company of Philadelphia, C. McIntosh, sales agent, has been removed from 284 Pearl street to the Downing Building, 108 Fulton street, New York. The McDaniel & Harvey Company manufacture Harvey's Patent Clean Sheet Iron and are sole factors for the McCullough Iron Company.

CONDITION OF THE

Hardware Trade.

BUSINESS continues in moderate volume, but the fact that the trade are buying in very small quantities and more frequently than usual tends to keep jobbers and manufacturers relatively busy, although the aggregate of sales is not up to the average. Prices are without important change and the market on the whole is low and irregular. The effect of the strikes remains to be seen. This matter would be a much more disturbing factor if there were anything like a normal demand for the product of furnaces and mills. As it is, some of them can close without materially affecting the market. Collections continue sluggish.

Advices from Chicago.—The Shelf Hardware trade keeps up very well. Orders have been quite numerous the past few days, and the month now promises to be fully as good as March or April. Some stimulus to trade has been imparted by the notice of an advance in freight rates to the West. Shipments have been hurried forward on this account to a noticeable extent. Jobbers, however, hope that trade will hold up to about its present volume through the summer. They have done so much better than they expected that they are inspired to take an encouraging view of the future rather than discouraging. Staple goods are hardening on account of the advance in raw material, and higher prices are being made every two or three days. Roofing Plates are still very scarce, especially American brands, but prices are held down to old rates. The Heavy Hardware trade is quiet, not only in Iron and Steel, but in wagon and carriage stock. The recent cold snap which has injured vegetation is looked upon with some apprehension, as it may still further depress the demand from farming interests, on which the Heavy Hardware trade depends largely for its prosperity.

Notes on Prices.

Wire Nails.—The Wire Nail market continues in substantially the same condition as last week as to the volume of business, but has a decidedly firmer tone, as the manufacturers, in view of the increased cost of raw material and the uncertainty as to the supply of fuel, are naming higher prices. Most of the mills are adhering to $1.10 at mill, but it is thought that this figure can in some cases still be shaded slightly. In view of the situation there is a disposition also to take orders subject to prices ruling at the time of shipment, and another advance would not be surprising. Small lots from store in New York are held at $1.25 to $1.30.

Advices from Chicago.—Manufacturers' agents report some demand from large distributors, but buyers generally are holding off until the situation clears up. Manufacturers are advancing prices on account of the scarcity of fuel and higher values of raw material. They are quoting at last advices $1.10 at mill, or about $1.20, Chicago, but agents are now instructed to take orders subject to factory acceptance. Jobbers have made two advances during the week, and now quote $1.20 for small lots from stock with no reduction for carloads.

Cut Nails.—A somewhat firmer tone has been given to the Cut Nail market by the prevailing strikes and the fact that some of the mills at least are aus-

pending operations for a time. The price of Western Nails at mill is 90 to 95 cents, the latter quotation being in most cases insisted upon, but lower prices are made in competing for Eastern business. Eastern mills are quoting 95 cents to $1 for Nails delivered on dock in New York. Small lots from store in New York are still held at $1.10 to $1.15.

Advices from Chicago.—Inability to obtain Coal has caused the Lakeside Nail Company to shut down, but they have accumulated a stock of Nails which will enable them to supply the trade if the stoppage is not too long. Sales have been good during the week. Prices are very firm at 95 cents for 55 cent average. Small lots from stock are $1.05 to $1.10.

Barb Wire.—In sympathy with other products which are affected by the strikes, Barb Wire is somewhat stronger. The market is represented by the following quotations for Four-Point Galvanized, delivered at the points named: Pittsburgh, $2.05 to $2.15; Cleveland, $2.10 to $2.20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.20 to $2.30.

Advices from Chicago.—An advance is expected on Barb Wire this week, owing to the scarcity of fuel at various works and higher prices of raw material. Inquiries have been fair, and in some instances large shipments have been made to the West in anticipation of higher freight rates. Factory lots of Galvanized Barb Wire are quoted at $2.20 to $2.25, Chicago, while small lots sell at $2.30 to $2.35, from stock. Painted Wire is held at 40 cents per hundred less than Galvanized.

Apple Parers.—We are in receipt of the following revised quotations on Apple Parers manufactured by C. E. Hudson, Leominster, Mass.:

	Per dozen.
Rocking Table	$5.50
Little Star	4 00
Daisy	3.50

Common Sense Lawn Sprinkler.—Stott Garden Implement Company, 136 Liberty street, New York, are manufacturing this Sprinkler. It is quoted to the trade at $12 per dozen net.

Refrigerator Fasteners — Bronze Metal Fasteners Nos. 4 and 5 have been put on the market by P. J. Conroy & Co., Paschall post office, Philadelphia. The No. 4 is sold at $8 per dozen and the No. 5 at $6 per dozen, subject to a discount of 40 per cent. to the trade.

The Premium Wringer.—The Colby Wringer Company, Montpelier, Vt., for whom Surpless, Dunn & Alder, 15 Murray street, New York, are direct representatives, have issued the following revised list of their Premium Wringer, the prices given being subject to a discount of 2 per cent. for cash:

	Per dozen.
No. 10, rolls 10 x 1¾ inches	$21
" 11, " 11 x 1¾ "	25
" 12, " 12 x 1¾ "	29

These Wringers are packed half a dozen in a case. The company's circular gives dimensions and weights of the different numbers.

Aluminum.—The Pittsburgh Reduction Company have issued a revised price-list of Aluminum, Ingot, Plate and Sheet, and Wire. The price of Plate and Sheet has been reduced 10¢ from the list printed in *The Metal Worker* of February 3, or to 80¢ base for ⅝-inch and heavier of a width wider than 3 inches and not wider than 12 inches. The Wire list has been entirely changed, as follows:

Aluminum Wire.—B. & S. Gauge.

Diameter B. & S. Gauge	Price per pound.
Nos. 9 to 14	$1.00
Nos. 16 and 17	1.05
Nos. 18 and 19	1.10
No. 20	1.25
No. 21	1.40
No. 22	1 50
No. 23	1.60
No. 24	1.75
No. 25	2.00
No. 26	2.25
No. 27	2.50

Glass.—There is no noticeable increase in the demand for Window Glass, while prices are firm and unchanged since our last report. The outlook is encouraging rather than otherwise, and additional pots are reported as having gone into operation during the past week. The opinion is expressed that tariff legislation will probably not influence the price of Glass during the present fire, and that foreign manufacturers will not import Glass largely while the action of Congress remains uncertain. New York and Pittsburgh markets are represented by the quotations for car lots of 85 per cent. discount for single, and 85 and 5 per cent. discount for double strength Glass. Small lots are quoted at 80 and 20 per cent. discount.

Old Metals.—Consumption is so restricted that the business doing in Old Metals has been of the narrowest character. Prices are weaker and the market generally dull and lacking interest. The following quotations represent about the price paid by dealers in this city for moderate lots:

Heavy Copper	℔ lb	6¾¢
Light and Tinned Copper	℔ lb	6¢
Heavy Brass	℔ lb	4½¢
Light Brass	℔ lb	3¾¢
Lead	℔ lb	2½¢
Tea Lead	℔ lb	2½¢
Zinc	℔ lb	2¢
No. 1 Pewter	℔ lb	12¢
No. 2 Pewter	℔ lb	6¢
Wrought Scrap Iron	℔ gross ton	$7.00
Heavy Cast Scrap	℔ gross ton	7.00
Stove Plate Scrap	℔ gross ton	3.50
Burnt Iron	℔ gross ton	2.50

Old Rags, Paper, &c.—The market is quiet, such business as is moving being chiefly in small lots. Paper mills, as a rule, are not making stock, but are running only to fill orders. When these are completed the mills stop; consequently the demand for Paper stock is limited. The prices paid for Old Rags, Paper, &c., in New York show little change, being about as follows:

No. 1 White Rags	℔ lb	3¼ @	3⅛¢
No. 2 White Rags	℔ lb	2 @	2¼¢
Mixed Rags	℔ lb	@	1¼¢
Blues and 3ds	℔ lb	1 @	1¼¢
Hard Sized White Shavings	℔ lb	2½ @	2⅝¢
No. 1 White Book Shavings	℔ lb	1¾ @	2⅛¢
No. 2 White Book Shavings	℔ lb	1⅛ @	1½¢
Light Book Shavings	℔ lb		1¼¢
No. 1 Mixed Shavings	℔ lb	1 @	1¼¢
No. 2 Mixed Shavings	℔ lb	¾ @	1 ¢
No. 1 Printed Books	℔ lb	1 @	1¼¢
Ordinary Mixed Books	℔ lb	½ @	¾¢
Newspapers	℔ lb		2-5¢
No. 1 Manila Paper	℔ lb	¾ @	1 ¢
No. 2 Manila Paper	℔ lb	⅞ @	¾¢
Bogus Paper	℔ lb		½¢
Common Paper	℔ lb		⅝¢
Straw Chips	℔ lb		½¢
Binders' Clippings	℔ lb		½¢
Jute Butts	℔ lb	1⅞ @	2 ¢
No. 1 Jute Bagging	℔ lb	1 @	1¼¢
Mixed Bagging	℔ lb	¾ @	1 ¢
No. 2 Bagging	℔ lb	½ @	¾¢
Hemp Twine	℔ lb	2 @	2¼¢
Manila Rope	℔ lb	2⅛ @	2¼¢
Jute Rope	℔ lb	1½ @	1¾¢
Mixed Rope	℔ lb	¾ @	⅞¢

Old Rubber.—The market is irregular and somewhat dull. Prices are soft, the following being the nominal quotations, New York delivery:

Car Springs, ton lots, ℔ lb	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb	@	.03½
Rubber shoes, less than carloads, ℔ lb	@	.03¼
Large Hose, ℔ ton	@	12.00
White Wringer Rolls, ℔ lb	@	.03¾
White Syringes, ℔ lb	@	.03¾

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Metal and Miscellaneous Prices.

CHICAGO, MAY 24, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.35
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.75 @$5.75
IC, 14x20.90 lb	@ 5.25
IC, 14x20, 100 lb	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansal and Dean Grades.—
IC. 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—
IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.60
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal, extra, IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood —IC, 14 x 20.....$6.00
IC, 20 x 28.....12.50

Roofing Plates.

Palm, IC, 20 x 28.....@$11.50
Palm, IX, 20 x 28.....@ 14.00
Empire, IC, 20 x 28.....@12.00
Empire, IX, 20 x 28.....@15.00
Hickory, IC, 20 x 28.....@ 12.50
" IX, 20 x 28.....@ 15.50
Alaska (heavily coated), IC, 20x28@$14.60
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 14.75
" IX, 20 x 28.....@ 17.25

Westmoreland:
IC, 14 x 20..... $6.00
IC, 20 x 28..... 12.00

Elwood:
IC, 20 x 28..... $11 50

Kenwood:
IC, 20 x 28.....$11.50

Furmston:
IC, 20 x 28..... ....$11.00

Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50

Illinois, Old Method:
IC, 20 x 28.....$17.00

E. L.:
IC, 20 x 28..... ....$12 50

Jessie:
IC, 20 x 28.....$12.00

Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20..... ....$9.50

Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 .....11.00

Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28.....19.00

Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28.....22.00

Neville, Stamped, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28.....12.50
" " IX, 20 x 28.....15.00

Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared).....$9.50

Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared).....19.00

Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.25

Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)....16.50

Columbia, IC, 14 x 20 (Stamped).... 7.25
" IC, 20 x 28 (Stamped)....14.50

Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50

Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28.....13.00

Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28.....12.50

Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28..... 12.00

Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
" (Redipped), IC, 20 x 28.....17.00

Old Process:
IC, 14 x 20..... 9.25
IX, 14 x 20.....11.25
IC, 20 x 28.....18.50
IX, 20 x 28.....22.50

H. B. L., Old Style:
IC, 14 x 20..... 7.75
IX, 14 x 20..... 9 25
IC, 20 x 28.....15.50
IX, 20 x 28.....18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 3-10¢	3 1-10¢
17 to 20	₩ lb 2 4-10¢	3 2-10¢
21 to 24	₩ lb 2 5-10¢	3 3-10¢
25 and 26	₩ lb 2 6-10¢	3 4-10¢
27	₩ lb 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ lb A, 10¾¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis. 75@5%

Copper—

Ingot.

Lake.....10¾¢ @ 11¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.)
(To No. 19 inclusive.)
Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.34
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 lb lots.)
Discount, 40%.

Slab Spelter—

Western Spelter..... .....4¢

Sheet Zinc—

600 lb casks.....4.50¢
800 lb casks.....4.70¢
Loose sheets.....4.80¢

Lead—

Soft Pig Lead.....4 ¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....13¢
Hallett's.....12¢

Wrought-Iron Pipe—

1¼ and under, Plain	60%
1¼ and under, Galv	50%
1½ and over, Plain	70%
1½ and over, Galv	57½%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Rivated	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.50 square
Climax.....$3.35 square
The Lloyd Spanish Tiling.....$4.50 square

Metallic Shingles—

Cushman's.....$1.50 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$0.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ lb, 2 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, B. Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Brown	₩ lb, 5½¢
" Ground in oil, Purple	₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls	54¢
Linseed Oil, Raw, in bbls	51¢
Mineral Paints	2@4¢
Orange Mineral	9½¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ₩ gal	34¢
Spirits Turpentine, in bbls	₩ gal..35½¢
Asphaltum, Trinidad Refined, ₩ ton	$45
Tarred Felt, 1 Ply, ₩ 100 lb	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.70
Roofing Pitch, ₩ bbl. of 300 lb	$3.00

NEW YORK, MAY 25, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:
Small lots.....₩ lb, 65¢
100-lb lots.....₩ lb, 63¢
Ton lots.....₩ lb, 60¢
No. 1 Alum num (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....₩ lb, 63¢
100-lb lots.....₩ lb, 60¢
Ton lots.....₩ lb, 55¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....₩ lb, 60¢
100-lb lots.....₩ lb, 55¢
Ton lots.....₩ lb, 50¢

Antimony—

Cookson.....₩ lb, 10¾¢
Hallett's.....₩ lb, 10 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List April 9, 1894.

Plain Round Tube.	Per ft.	
¾ in. up to 2 in.	$0.35	25 @ 30%
⅝-in. up to ¾-in.	.36	
½-in. up to ⅝ in.	.38	
⅜-in. up to ½-in.	.41	
5 16-in. up to ⅜ in.	.48	
¼ in. up to 5-16-in.	.65	
3-16-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger	Special	
2 in. to 3 in., to No. 16, inclusive,	.38	

Copper and Bronze Tubing—8¢ ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square*—
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats...19¢ ₩ lb, net

Ingot.

Lake.....10¾¢
Ansonia Grade Arizona.....10 ¢
Ansonia Grade Casting.....9½¢
Planished......net
Sheet and Bolt......15¢ ₩ lb, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....85%

Stove-Pipe—

Ruffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2.50	2.80¢
Nos. 17 to 21	₩ lb, 2.60	2.90¢
Nos. 22 to 24	₩ lb, 2.70	3.00¢
Nos. 25 and 26	₩ lb, 2.80	3.10¢
No. 27	₩ lb, 2.90	3.20¢
No. 28	₩ lb, 3.00	3.30¢
American B. B.	₩ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11¾@12½¢
Patent Planished ₩ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		75@75&5%
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Lead—

American Pig.....3¾¢@4¢
Bar.....4¼¢
Pipe.....5½¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2½¢ ₩ lb.

Metal Exoanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	¾ @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil:	
Raw, ₩ gal	@ .50
Boiled	@ .53
Spirits Turpentine:	
In bbls	@ .30½
Putty:	
In barrels and ½ bbls	.01⅝ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01¾ @ .02¼
In bladders	.01¾ @ .02¼
Roofing Material, &c.:	
Asphaltum, Trinidad Refined, ₩ ton	$30.00@$35.00
Asphaltum, Rock, ₩ ton	$14.00
Coal Tar Felt, 1 Ply, ₩ lb	2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft.	$1.85
Roofing Pitch, ₩ bbl	$2.25

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, June 2, 1894.

DAVID WILLIAMS, - PUBLISHER

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CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Catalogues of Heating Apparatus.

Examination of a considerable number of catalogues and circulars of hot water heating and steam heating apparatus recently received, and a comparison of these with a number of catalogues issued from ten to fifteen years ago, shows that recent publications of this class have undergone a very marked improvement. Not only in their general design and execution as regards printing and illustration is this improvement manifest, but in the literary style and greater accuracy of statement. The heating trade is evidently getting down to a scientific as well as practical basis. In modern catalogues principles are recognized and correctly stated that, in the majority of cases, a few years ago, would have been either wholly ignored or, if the attempt to state them were made, would have been very clumsily or inaccurately set forth.

Efficiency of Heating Surface.

The difference in efficiency of heating surface in boilers, consequent upon its position in relation to the direction of flow of the flame and heated gases generated on the grate and its greater or less exposnre to direct radiation from the burning fuel, together with the direction and rapidity of the currents of water flowing over the water side of the metal, is one of the principles now much more generally appreciated and understood than it was years ago. Mere extent of heating surface is no longer claimed by the more intelligent boiler manufacturers to indicate, of itself and independent of other considerations, superior economy of fuel or greater effectiveness in steaming than can be secured by a better design, though perhaps a smaller surface. The limiting conditions in the actual work of boilers are better understood and recognized. The proper relation of grate area to heating surface for high efficiency is much more generally observed.

Rating of Boilers and Hot Water Heaters.

But above all other indications of improvement in the publications of the heating trade, the disposition toward correct rating is, perhaps, the most notable and commendable. The heating trade has heretofore been wont to discount the ratings of boilers as given in catalogues, and perhaps will find it prudent to do so still, except in cases where individual experience has proved ratings to be reliable; but there now appears a tendency to rate boilers from actual test in average service. The exaggerations resulting from the guess work or enthusiasm of inventors, which some years ago taught steam and hot water men the necessity of extreme caution, are gradually disappearing from the statements of manufacturers, and much more reliable ratings are now generally made. Not that manufacturers have, as a class, willingly lent themselves to deception; on the contrary, they are reluctant, from principles of sound business policy, to overstate the efficiency of their boilers. But in some cases they have deceived themselves by improperly conducted experiments, and in others have accepted without due verification the statements of sanguine inventors; while the fear of underrating, and thus placing themselves at a disadvantage in the market, has often maintained boiler ratings at higher figures than experience has justified after the suspicion that the rating was too high has become almost a certainty.

Tests of New Boilers.

One reason for overrating has been the acceptance of results of tests of new and perfectly clean boilers, fired with the best fuel and worked under the most favorable conditions, as what may be relied upon in average actual service; or, if some allowance has been made for decrease of efficiency in actnal use, a too low estimate has been put upon this decrease. Very few heating boilers, as generally cared for and attended, will, on the average, work within 20 per cent. of their efficiency as tested when new, in the manner named. The popular rating of a boiler will finally come from what it will do in ordinary practice; and if its listed rating varies widely from this, the fact soon becomes well known in the trade, and any temporary advantage in sales obtained from an exaggerated rating is sure to be neutralized by a reaction upon the reputation of both the goods and the makers of such statements.

Influence of Electric Light on Plants.

An interesting series of experiments made by the Hon. W. W. Rawson of Arlington, England, to determine the influence of the electric light upon the growth of plants, are mentioned by *Invention*, a London journal. Mr. Rawson claims, as the result of his trials, that he gains five days in each of his three crops of lettuce—that is, two weeks in a season—by using the electric light in his greenhouses. He states, further, that the gain on one crop pays all the expenses of the electric lighting for the season, thus giving him the gain on the other two as clear profit. His attention was, we learn, first called to the usefulness of the light by the advance made in the growth at the ends of his greenhouse next the street and in the glare of an electric lamp. This was so marked that he introduced the light throughout his lettuce and cucumber houses with the most satisfactory results. Dr. Baily, another English experimenter in this line, states as the result of his own tests that the influence of the light is greatly modified by the interposition of a glass roof. Plants injured by a naked light were benefited by the protected light. He found that five hours' light per night at a distance of 12 feet hastened the maturity of vegetables a week or ten days, although it proved injurious to young plants.

The workingmen's associations are now memorializing Congress to take immediate action to restrict immigration. This is a good movement. When workingmen take this matter up in earnest Congress will doubtless discover some more effective way of discouraging undesirable immigration than has yet been devised. The tide continues to flow this way too strongly, notwithstanding the supposed check given to it by the depression in business here.

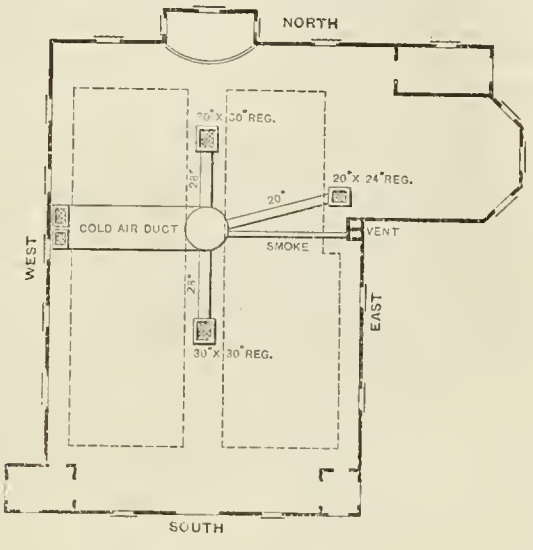
Some of the members of the Toronto Board of Trade are a queer lot, remarks the *Canadian Manufacturer*. A few weeks ago they passed strong resolutions urging the Dominion Government to take vigorous action looking to the building up of the Canadian pig iron industry, and later they send a deputation to Ottawa asking that pig iron be placed in the list of non-dutisble articles.

At the Watervliet, N. Y., arsenal gun shop on the morning of May 24, in the presence of a number of interested spectators, the jacket of a 12-inch gun was shrunk on the tube made for it. This is the fourteenth of 12 inch caliber that has been shrunk at the gun factory.

THE LETTER BOX.

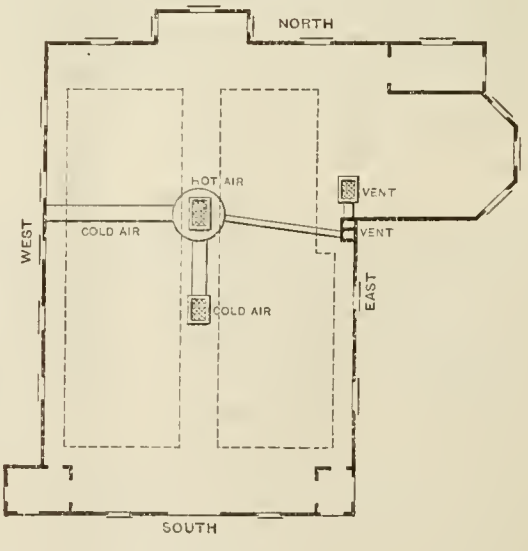
Wants a Better System.

From Cæsar, *Louisville.*—In *The Metal Worker* of May 12 I note an article from "W. S. G.," Penbrook, Pa. The only comment necessary is that "W. S. G." did not roast the architect sufficiently. The plan offered by the latter is well calculated to heat cellar to about 100° and auditorium 40° to 50°. As this is not desirable I offer the following with diagram of adjustment. I would place furnace as per diagram and take the hot air through a 30 x 36 face plate and border directly over furnace. Ten feet toward front of building I would place a register having three-fifths of the capacity of the hot air register and with pipe of three fifths of the capacity of the hot air pipe, connecting it to a pit under the furnace. The other two-fifths of the capacity of the hot air register I would use in a pipe connected to pit under furnace and run to outside air. I would place vent register as designated and give both pipe and register the same capacity as the vent flue. Let "W. S. G." use faces and borders only on this job. Such a plant will heat this building with 25 per cent. of the fuel that would be consumed in plan offered by the architect. If "W. S. G." had done the proper thing in this case he would have firmly passed the job and refused to figure on it. It is not well for a heating man to waste his time on such jobs as the one offered, in which such dense ignorance of the laws governing warm air heating is displayed. It is my experience that it requires a full lifetime of close application to learn the entirety and details of our business, yet we find some people who after four or five years' experience have mastered the details of every business. Comment is unnecessary.



Wants a Better System.—Plan by Cæsar.

From Hess, Snyder & Co., *Massillon, Ohio.*—Noticing in *The Metal Worker* of May 12 that "W. S. G." of Penbrook, Pa., wanted a plan for heating a new church, I send herewith a rough sketch showing the furnace in center of the building, using two 28-inch pipes with 30 x 30 registers in main aisle, 20-inch pipe with 20 x 27 register in side aisle next the small room on the east side. We would arrange this furnace so as to take both inside and outside air, using inside air when first firing until the church is warm, then using outside air. He failed to give size of ventilator, consequently we do not know what sized duct should be made. The ventilating duct should be the same capacity in square inches as the size of the foul air flue. The duct or ducts can run to register on the side of the chimney 2 inches above the floor, or they can be sunk in any part of the building and conducted to chimney through wood boxes. We should be pleased to have "W. S. G." write to us for a catalogue.



Wants a Better System.

Choked Water Backs.

From E. S. M., *Westminster, Md.*—In answer to "E. J. Y.," Regina, N. W. T., whose inquiry appears in *The Metal Worker* May 19, he may be interested in knowing that I have had the same trouble myself, and tried brass piping, thinking it might possibly help the matter, but it did no good. I then put the pipe where the hottest part of the fire would not strike it and have had no trouble with it since, which is over two years ago. It formerly filled up every month. The reason, I think, of the present relief is that the water got too hot and steamed, which it will not do if put where the coil will not be subjected to so high a heat. I know that the stoppage must have come from the water steaming, for the boiler would steam, and I think if "E. J. Y." examines his closely he will find that it also steams. Please ask him to publish the result of his experiments, as I would like to know if the same remedy would be effective with another coil.

From Swiped Joint.—A number of correspondents of *The Metal Worker* besides "E. J. Y.," whose complaint appeared May 19, find difficulty with choked water backs, which is a common trouble wherever hard water is used. A remedy for this might possibly be found in arranging the circulating pipes connecting the range boiler, and water back so that the same water would constantly flow through the back. Suppose the hot water pipe to boiler from back connected to top of boiler, then ran directly downward through center of boiler and out at bottom and thence to the range. This water would lose its heat while passing through the vertical pipe in boiler surrounded and in contact with colder water. The circulation would be constant and would convey the heat imparted to it in the back and lose it while passing through the boiler, thereby heating the water stored in the boiler doubtless

quite as well as though it mingled with it. There being no introduction of new or fresh water laden with earthy matter, no deposit would form in the back or pipes to close them. There would necessarily have to be some way provided to keep these pipes full at varying temperatures and permit sufficient water to escape to prevent bursting the pipes when expanded under boiling temperature. It is practical, I believe, and has been done successfully. A young man interested with me in business piped a boiler in some such way a year or more ago and it has given satisfactory results so far. Here there is no need of such an arrangement and hence it is not done. The vertical pipe inside boiler might and perhaps should be larger than the exterior ones—say 1½-inch. I suggest that your correspondents try it.

Paper Backed Corrugated Iron.

In submitting the query of Caswell & Moore to the readers of *The Metal Worker* last week a mistake was made in the address. Their correct address is Caswell & Moore, 237 Bridge street, Phenixville, Pa.

Making Solder.

From S. E. B., *Chicago.*—Will you please publish in *The Metal Worker* the best brands of tin and lead for making half and half solder? Am I correct in supposing that bar metal is purer than pig metal?

Answer.—Some good brands of lead are Omaha, Globe, Grant, Pueblo and Pennsylvania. Tin is known as Straits, Banca, Australian, Billiton and Lamb & Flag. It is not generally considered necessary to order either of these metals by the brand to get a good article, as the metal houses handle only such as are adapted to the requirements of their trade. Aside from the possibility of bar metal having been refined by an additional melting, it is improbable that it is any purer than the pigs from which it is made.

Front Wall Traps.

From L. J. S., *New York.*—I would like a little information on the use of a running trap at the front wall of a building. There has been a system of sewers put in in our town, increasing the amount of plumbing to be done. There are two firms here who do most of the work. One firm think it is proper to connect with the sewer and run a line of soil pipe through the house and up through the roof, having a trap in the main drain just inside the cellar wall. On the house side of the trap they run a 4-inch pipe to the outer air for the first fresh air inlet, commonly called a foot vent. The other firm think it is proper to connect with the sewer and run a line of soil pipe through the house up through the roof, omitting the tap and foot vent, saying that it is not necessary, as they do not do it in large cities such as Chicago and New York. I should like to know which system is proper.

Note.—We shall be glad to have our plumbing readers discuss the question of the use of a running trap and fresh air inlet. In looking over the ordinances of some 50 cities in different parts of the United States, we find that in two-thirds it is mandatory that a running trap with a fresh air pipe on the house side of it shall be used in all buildings. This is true of New York and Philadelphia. In a number of other cities no mention is made of the trap or foot vent. In Chicago a set of diagrams accompany their plumbing regulations, showing different methods of running the soil pipe and connecting with the sewer, and the use of a running trap and foot vent is not required. In Montreal the use of a running trap and foot vent is only permitted on special application to the authorities according to a set of regulations at hand. It is held by some that sewers and sewer air would be incapable of harm if the trap was omitted and additional ventilation was afforded by a pipe running from the main drain up above the roof inside of the front wall. Others hold that the foot vent coming up in the sidewalk is liable to stoppage by dirt or if not stopped it is dangerous to the passersby, because it discharges foul air, perhaps laden with disease germs, when any fixture in the house is flushed. Some think that the foot vent should be on the sewer side of the trap to protect the house and others think that it should run to the roof in all cases.

Remedying Defective Flues.

John Le Sauvage, 37 Duane street, New York, whose sign proclaims "defective flues a specialty," has had many interesting experiences with poor draft chimneys and smoky fire places. He says there are 101 reasons why chimneys fail to draw, and any one of them is sufficient to make trouble. In a large restaurant building eleven years ago the proprietor was annoyed by a lack of draft in his chimney, or, more properly speaking, smoke stack. Different chimney experts tried their skill in removing the cause of the trouble, but none was successful. The smoke stack was used in connection with two steam boilers, and in endeavoring to improve the draft one mechanic had used an exhaust fan on the roof in connection with it. This was arranged with a tight damper at the top of the smoke stack proper, operated by a chain running down through it to the basement. A tee connection was made at the side of the smoke stack and a round elbow then pointed down to connect with another round elbow running horizontally, into which the exhaust fan was placed. Beyond the fan another round elbow turned the pipe upward so as to discharge the air straight up. Even with this arrangement they were unable to get good results, and all due to the fact that where the horizontal pipe connected with the vertical shaft there was a contraction in the area of the flue, and the connection was made in such a way as to produce conflicting currents and undue friction. The smoke pipes running from the two boilers, which were equally distant from the flue, connected into a head at the base of the flue. All of this pipe was rectangular, and each of the smaller pipes was of ample capacity for the purpose and the head into which they connected was in proper proportion to their areas. On investigating it was found that the smoke stack was 30 inches in diameter and ran up through a square corrugated iron shaft as a means of protection against fire. To make the change at the base necessary for a good draft it would be necessary to take down the inside smoke stack, which was about 80 feet high, but an examination showed that the smoke pipe was so far weakened by corrosion that it would not stand taking down and a new pipe would therefore be required. On assuring the owner that the shaft could be made absolutely satisfactory, he decided to go to the expense of making the change suggested. A round elbow was made to connect with the square pipe and was continued square in shape well inside of the corrugated shaft. From the square end of this elbow the pipe gradually assumed a round form, and new round pipe was run to the top of the building. After the job was completed, which was done between Saturday night and Monday morning, fire was started in one of the steam boilers, and with the rapid draft now secured one boiler was amply capable of furnishing all the steam and heat required. The total cost of making the changes was $660, but the owner is well pleased with his expenditure and has stated that the saving in fuel alone will more than pay the cost in less than two years, and that one steam boiler is thus held in reserve for duty in case of accident or extra duty being necessary.

In another case a chimney ran up on the north side of a high building, and it was difficult at times to get an upward draft, particularly when there was a cold northwest wind, as the building was exposed on that side. On being called in to overcome the trouble, which was due to a cold chimney, Mr. Le Sauvage found that a new building would be erected next the chimney in a few months, and advised the owner to submit to the inconvenience in the mean time rather than go to the expense of insulating the flue. The new building was erected and the flue which previously was defective in operation gave excellent satisfaction. Another difficulty frequently found is due to the space in the chimney below where the pipe enters. In some cases no difficulty is caused by this space and at other times all that is needed to overcome the trouble is to stop off the chimney just below the pipe. A good way to stop off a chimney effectually yet not permanently is to insert through the pipe hole strips of heavy sheet iron long enough to wedge in the flue. Enough of them must be used to prevent ashes falling through. Then by filling in on top of the sheet iron with cinders and ashes an air tight stop is made. Such a stop can be easily removed when a stove is to be connected with the flue at a lower point. In a number of years practice Mr. Le Sauvage has accumulated a valuable fund of experience and is now seeking the flue that he cannot make operate.

Baltimore advices convey the report that a powerful association has been organized by leading capitalists, bankers and railroad officers in the South under the name of the Southern Immigration, Land & Title Company, the object of which is to develop and colonize Southern lands and generally to encourage and direct immigration and trade in the Southern States.

Continued dullness is reported as the prevailing feature in the dry goods trade throughout the country.

THE RETAIL STORE.

Electrical Devices as Hardware.

BY W. E. GILL.

It is only in recent years that electrical devices have come to be recognized as among the conveniences of the home and the necessities of the hotel, the business house, the bank and the factory. A few modern electrical inventions, notably among which are the telephone and the electric light, coupled with the energy and push of those engaged in the prosecution of electrical enterprises, have been largely instrumental in educating the public to a just appreciation of the value of electricity in domestic and business life. Electricity as applied to the liberal arts has become so extended in this country that a hotel without its guest call or a town without its electric railway, electric lights or the ubiquitous telephone would be considered commonplace indeed. Until recently electrical goods, with but few exceptions, have been handled and vended by manufacturers and dealers who made it their special business and who devoted their entire attention to the electrical industry. This was perhaps necessary while the goods were passing through their infantile period, and the same would apply to any like industry at the same stage. In many of its branches the electrical business will of necessity remain so, requiring as it does a special training to enable one to follow it successfully. There are, however, a great many articles and devices which are in constant demand almost everywhere, which have been so simplified as to render them staple.

WE WOULD CAUTION

the Hardware merchant who contemplates adding electrical goods to his already varied and diversified stock against going too far at the beginning. Location and the extent to which electrical enterprises are being carried on should have much to do with the choice of a line. Buy only from manufacturers or dealers of known and acknowledged reputation. There is, perhaps, no line of goods carried in stock by the Hardware merchant which he will be less able to criticise than his electrical stock. He must therefore rely upon the manufacturer or jobber giving him fair value in the goods they furnish.

THE INSTALLING

of electric railway and electric lighting plants, also fire alarm systems, is being generally carried on by companies organized for the promotion of some special system, the apparatus for which is usually patented or controlled by them. This work of necessity requires more or less scientific knowledge and men trained in special branches to perform the work. There is much, however, that comes within the scope of the Hardware merchant, and that could bear the same relation to his business that the tin shop and furnace department now do. The extent to which he should engage in electrical work of course depends upon existing conditions. In a locality where there are electrical fitters, the merchant might find it more profitable to carry limited stock of staple goods, so as to be able to supply the wants of the local trade, rather than to engage in competition with them. In this way he would avoid coming in contact with the consumer and avoid many of the petty annoyances incident to the electrical fitters' business and which arise from causes not under his control. All electrical devices depending upon a battery as the source of the electric current require

OCCASIONAL ATTENTION.

The battery must be supplied with water, and the elements when used up must be replaced by new ones. These simple matters are very apt to be neglected by the consumer, and when the electrical service fails, he invariably resorts to the fitter, who must needs make a trip to do what the consumer or his servant might have done had they been properly instructed. The merchant will indeed find more of these petty vexations to contend with in the electrical fitting department than in any other branch of his business. In the event of his adding an electrical fitting branch he should first acquaint himself with the simpler house appliances; the most common of which is the electric bell. There are manufacturers who have made a special study of the requirements of the Hardware trade in electrical devices for domestic and business purposes, and who put up and furnish in the most convenient form the goods which are in common demand everywhere, packing them in sets to suit most all ordinary requirements, and in such a form as to be readily stocked and handled from the shelf in the same manner that the merchant would handle a set of sliding door hangers or a set of store door handles and lock. The necessary directions are to be found packed with the sets, making it easy for a person of ordinary intelligence to put them in place in working order and to care for them without assistance from any one.

WHAT TO CARRY IN STOCK.

To start with, a merchant should place in his stock a few electric bell sets, such as are used for front doors and dining rooms in residences, for calls in office, banks, factories, stores, &c., selecting those sets which are packed with trimmings best suited to the requirements of his particular locality. These sets come packed with sufficient electrical wire for connecting up in any house of moderate size. In a great many instances, however, more wire will be required than is packed with the sets. It will, therefore, be desirable to carry some electrical wire in stock, such as is commonly used and known as No. 18 gauge annunciator, on spools of, say, ½ pound or 1 pound each, which sizes are regular; also ½-inch electricians' staples, in 2 ounce packages, packed one dozen packages in a box; and for repairs, some complete batteries and parts of batteries, such as battery zincs and sal ammoniac, in 5-ounce paper boxes or bags, one package being the quantity required for one complete charge for a single battery. A very simple, comprehensive and comparatively inexpensive sample for the salesroom may be made, using the wood box in which the set is packed, by screwing the cover to the back of the box, so as to extend above the box and mounting thereon the bell, wire and push, and placing the battery inside the box, all in full view; the battery then being charged and connected to the bell and push with the wire, and by pressing the push knob the bell will be made to ring, the current passing through the entire coil of wire. These electric bell sets should be on the shelf of every Hardware merchant, whether he does fitting or not, as they will meet the requirements of the average house builder or contractor in need of a simple electric bell, they being in the most convenient shape to handle and carry in stock. Should the merchant desire to engage in the

FITTING BUSINESS,

or carry stock for local fitters, he will find it convenient in addition to the sets to carry a limited line of electric pushes in bronze for out of doors, and wood for indoors; iron frame bells with 3-inch gongs for ordinary house and office use, and larger for barns, mills, factories, stores, &c., according to requirements; complete electric batteries and parts for same; No. 18 electrical wire on spools of ½ pound, 1 pound and 8 pounds each; ½-inch electricians' staples in 2-ounce, ½-pound or 1-pound packages; electric door connections for use on store entrance doors to indicate the opening and closing of the door; dining room pushes to be operated with the foot for calling a servant during meals, &c. The foregoing list comprises the goods which are in most common demand where electrical devices are used. There are other and kindred lines such as annunciators for hotels and residences and electric gas lighting apparatus which it would be manifestly unwise for the Hardware merchant to handle as a selling stock, and rather beyond his ability to handle as a fitter until he thoroughly understands how to install electric bells in their various applications. Regarding equipments and supplies for electric street railway and electric lighting plants, it would be impossible to here specify what goods might be advantageously handled, as local existing conditions and requirements and the knowledge of the merchant in these special branches of electricity will alone determine.

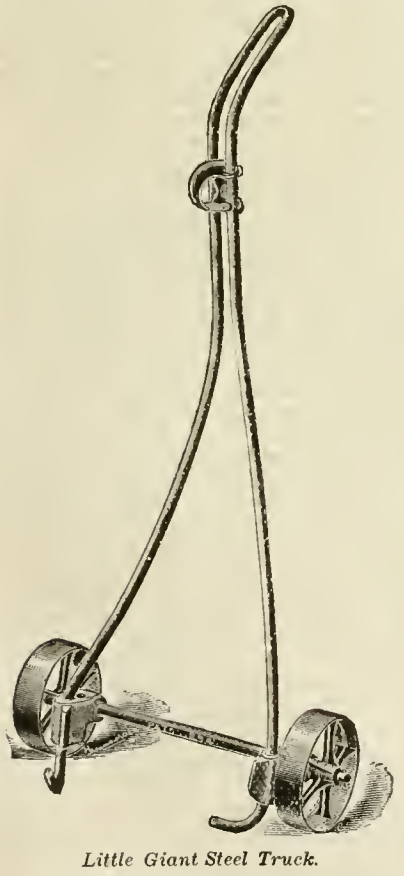
D. H. BURTIS of 27–29 East Washton street, Phenix, Arizona, is sending his friends in the trade a postal card, the back of which carries an advertisement of his line of specialties. The illustration with which it is embellished is unique in the extreme and self explanatory to residents of the section where Mr. Burtis does business. The line of goods which he carries includes stoves, ranges, pumps, tin, granite and copper ware, gasoline and oil stoves, sheet and corrugated iron, brass goods and fittings, and he is sole agent for the Blake steam pumps, Champion mowers, Johnson's self dump rake, Wilson's steel headers, Garlock steam packings, &c. Mr. Burtis states that he operates in connection with his store a thoroughly equipped tin and plumbing shop.

THE UNITED STATES GRAPHITE COMPANY of Saginaw, Mich., have received

some particularly fine lumps of graphite from their Santa Maria mine in Mexico. E. C. Ewen, manager of the company, states that owing to the extreme purity and consequent softness of the material, it is very hard to get it from the mine in large pieces. When it is considered that their mine is over 30 miles from the railroad, and the material, after being mined and sacked, is then hauled in ox carts over 30 miles of rough road, then loaded into a car and transported nearly 2500 miles to Saginaw, it is remarkable that the lumps reach that place in such good condition. Mr. Ewen spent a large part of the past winter at the mine, and it was under his supervision that the lumps were taken out and handled through to Saginaw. It is the intention of the company to carefully pack these lumps and distribute them among some of their friends and customers.

Little Giant Steel Truck.

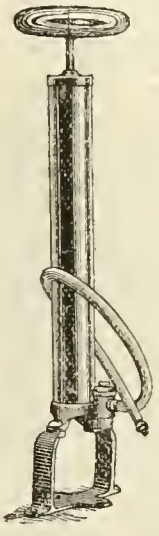
G. L. Van Namee Mfg. Company, Syracuse, N. Y., are offering the truck herewith shown. The truck is made entirely of metal, with wide tired wheels and well fitted bearings. It is provided with a self adjusting hook to secure the barrel at the top, also a clamp to prevent the axle from turning. The claim is made that the truck occupies but little space, and that while combining great strength it is in construction comparatively light, its total weight being 14 pounds. It is adapted for use in factories, stores, flour mills, &c., also for removing ash and garbage barrels. The above company are owners of the Little Giant Truck Company's plant.



Little Giant Steel Truck.

The Cyclone Pump.

The Davis & Stevens Mfg. Company, Seneca Falls, N. Y., are putting on the market the bicycle pump here shown. The pump cylinder measures 1¼ x 12 inches, nickel plated, provided with a turned brass plunger, ¼ inch thick, and with a cupped plunger leather so, it is stated, that it does not cut out the cylinder. The pump has a base of malleable iron, by which it may be held by the foot or screwed to the floor. The base is attached to the pump by bolts and nuts, and may be easily detached for close packing or when carrying the pump on the wheel. With the pump is furnished a small hose, with a coupling to fit all nipples, or larger hose with a thumb screw coupling to fit all tire valves without using any nipple The point is made by the manufacturers that the pump is strong, durable, convenient and cheap.



The Cyclone Pump.

The Dickson System of Heating and Ventilating School Buildings.

H. Sandmeyer & Co., Peoria, Ill., furnish us the following description of the Dickson system of heating and ventilating, as applied to school buildings.

The object of the inventor of this system is to circulate enough air in each schoolroom to give each pupil 2000 feet of air per hour without mechanical power. We make no pretensions to ventilating in summer only by opening windows and doors, and confine ourselves to the problem of winter ventilation; in other words, to heat and ventilate a schoolroom during that season of the year when fire is needed to warm the rooms and the doors and windows are kept closed.

To better describe the system we will consider it in connection with one room of a school building. We first ascertain how large a flue it will take to deliver a certain amount of air in the room in a given time heated to a given temperature in order to properly warm the room. Having thus provided a way to bring in the required number of cubic feet of air to properly heat, we must now construct a flue of suitable size to take out the same amount of air in the same time as is required to bring it in. The incoming air must not be heated to over 175° and the outgoing air must not be lower than 60°. The warm air must enter the room 8 feet above the floor and the foul air be taken out at the floor line. A flue to exhaust 100,000 feet of air per hour must be provided with heat in order to cause a rapid upward current at all times. In order to heat this vent flue economically and without any special appliances, we construct a heat and vent flue side by side, one side of the heat flue making one side of the vent flue. The material composing the partition which separates the heat and vent flue is sensitive to heat, such as copper, and the heat that passes through this partition is sufficient to keep the vent flue in operation at all times. To provide for ventilation when but little fire is required we provide an opening in the partition between the heat and vent flue, and by opening a damper all the heat from the heat flue is thrown into the vent flue, which causes a rapid upward current sufficient to ventilate in murky, bad weather, when but little fire is needed. By placing the heat and vent flues side by side we have what might be called an aspirating flue. By introducing heat at the bottom of the heat flue, with a proper cold air supply, we complete the system for one room.

If we have two or more rooms all that it is necessary is to simply duplicate the system for each additional room. Cold air rooms are provided in the basement of sufficient size to guarantee an abundant supply of air at all times. These rooms are supplied with air from large openings in the four different sides of the building. By the Dickson system of heating and ventilating a separate system is provided for each room, and the opening of a door or window in one room does not affect the heating and ventilating in any other room. By this system we can circulate 100,000 feet of air in each room per hour in any sized school building from one room up. Either steam or furnaces can be used to provide heat.

It would seem by this arrangement that it would require a large number of flues or chimneys, but such is not the case. True, it requires a heat and vent flue for each room, but the heat flue for the first floor makes a vent flue for the second floor, and the heat flue for the second floor makes a vent flue for the third floor. By this arrangement it only requires two chimneys for an 8 or a 12 room building. The vent flues must extend high enough above the apex of the roof so as not to be affected by the winds.

The Dickson system of ventilation is applicable to any kind of a building, and it has been introduced into schoolhouses of all kinds and opera houses and churches. The success of the system depends entirely upon the construction of the heat and vent flues. By the construction of the flues as here described, the required 2000 feet of air can be obtained without mechanical power.

European journals note that there is at present being established at Constantinowka, in South Russia, a large iron and steel works by a company formed in 1891, with a capital of $2,000,000, and known as the Forges du Donetz. The works will include a large Bessemer steel making plant, a rail rolling mill, foundry, forge and an engineering shop. The plant will, it is expected, be put in operation this year, and it is stated that orders have already been secured for the supply of 100,000 tons of rails to the Russian State railways during 1895-6-7.

The Italian Government has issued a circular warning its citizens against emigrating to the United States. It specially indicates the States of Pennsylvania, Maryland and Delaware as places where employment is difficult to procure.

Press Working of Sheet Metals.—VII.

BY OBERLIN SMITH.

Drawing Process.

The drawing process for sheet metals, by which deep cylindrical, conical and other cup shaped articles are made seamless from a flat sheet, is very different from the ordinary forming process used for shallow articles of like general nature; or, to speak more accurately, it is an amplification of the same, embodying certain new and entirely different principles. It is in its nature as interesting as it is unique. It is, moreover, a comparatively new process, probably dating back not more than 50 or 60 years. As near as I can learn it was first used in America by Mr. Grosjean of New York, who informs me that he thinks it was practiced in France over half a century ago. I am informed by Mr. Neidringhaus of St. Louis that the Prussian system of metal drawing, as it is called, was invented at Saarlouis, Rhenish Prussia, by the Strouvelle Brothers. It probably was not practiced on a large commercial scale in this country much earlier than 1866, and the first presses were made here by a Mr. Marchand, who had been employed by Mr. Grosjean and his associates.

This process is sometimes called "stamping," which term, however, is a misnomer, being improperly used to designate something which is the successor of the old stamping process, but entirely different from it. The latter was practiced for many years in the production of various seamless utensils, such as pans, bowls, plates, cups, &c., which were gradually coaxed down into shape, so to speak, by frequently repeated blows in a drop press.

Sheet metal drawing proper consists in so confining a certain outer zone of a blank which is to be drawn into a cup like shape between two rigid flat surfaces that the metal cannot wrinkle when pulled radially inward, which it attempts to do on account of the constantly decreasing circumference of its edge. In Fig. 231 is shown, in vertical axial section, a pair of combination push through drawing dies, such as are used for any plain cylindrical articles of medium depth, such as blacking boxes, can covers, clock cases, &c. They consist of a lower die, L, an upper die, U, and a drawing punch, P. They are shown with a cutting edge, *c c*, for which reason they are termed "combination dies"—as a sheet laid between them when U descends is first cut into a blank, as shown in two views in Fig. 232. They could, however, just as well be used for blanks already cut, the edge *c'* being in such case somewhat rounded off to facilitate easy entrance of the blank, and remaining to serve the purpose of a gauge merely. Where blanks rather than whole sheets are used, this gauge ring may be omitted and gauge pins substituted therefor, as in Fig. 240, at G G. In some kinds of work no gauges are used except the fingers, the top surface of the die being made of exactly the same size as the blank, to facilitate adjusting in this way.

The operation of these tools is as follows: The die U descends until the blank is firmly clamped between it and the die L, at which time U stops, the ram of press being provided with a proper dwell until the punch U has had time to descend, forming the work gradually to shape, as shown by its successive stages in Figs. 233, 234 and 235. The punch then ascends, the work being prevented from rising by the sharp, hard stripping edge S. The slight expansion of the top edge of the work by its own elasticity is usually sufficient to prevent its pulling up through the die again. In some cases, however, there is a tendency to do so, which can be prevented by three or more spring pawls inserted in the die at a point below S.

In all work of this kind it is important to vent the punch by an air hole of ample size, somewhat as shown in Fig. 243, as otherwise there is a tendency for the work to be drawn upward by suction. This vent has been omitted from the other engravings.

It is evident that if the die U remains stationary during the drawing of the work, the thickness of the flange thereof—that is to say, the flat part from the edge inward, which would be the rim of the inverted straw hat, so to speak, represented by Fig. 233—must remain of the same thickness as the original blank; and therefore the sides of the finished cup, Fig. 235, as well as its bottom, will remain of uniform thickness—that is, if there happens to be sufficient room between the sides of punch and die, so that the metal is not squeezed thinner. It may be said that the die U might be easily forced upward by the attempted thickening of the metal, the press springing open to allow for the same. This is true, but in practice the fact is that the thickness is changed but little. We have, therefore, in this process an interesting action taking place in the flange, viz., the throwing together—in blacksmith's parlance the "upsetting"—of the metal in a circumferential direction, while a pulling apart or stretching action is going on in a radial direction, and that to an amount, as experience proves, just about sufficient to balance it.

This action is very prettily shown by a graphic method. Four small dots arranged in a square are marked upon the blank, as in Fig. 232, and this square will be seen to have elongated itself radially and shortened itself circumferentially into the form of a diamond during different stages of the work, becoming a very elongated one at the last. The same action is shown in Figs. 249 and 250, which were photographed from an actual piece of drawn work about 5 inches in diameter by something over 2 inches deep, the blank for which was made of decorated tin, upon which were ruled cross lines, as shown. The new relations of these lines to each other upon the sides of the cylindrical cup tell the story far better than mere words can do.

There is evidently here an interesting instance of the cold flow of metals, the molecules thereof being obliged to move freely among themselves and arrange themselves in new positions. Such flow takes place, as experience proves, without weakening the metal, it merely growing somewhat harder in the same way as it would in any hammering or rolling operations. This subject has been previously treated by the writer in a lecture delivered by him before the Franklin Institute, entitled "Flow of Metals in the Drawing Process," which was published in the journal of the Institute for November, 1886. From it I quote the following paragraphs:

"Common instances of elastic flow may be found in the wonderful stretching of a piece of india rubber to perhaps ten times its normal length and its indignant return to exactly its original form, or in the bending or twisting of any wooden or metallic springs, &c.

"Instances of non-elastic flow are observed most frequently perhaps in connection with semi-solids, such as the clay upon the potter's wheel, the dough in the hands of the housewife, or the putty under the glazier's knife. In the apparently rigid solids such action is not popularly conceivable, but a little observation will show that the cold forging of a piece of iron, or, indeed, any bending or other permanent distortion of any piece of metal, could not occur without this flowing of its molecules among themselves. Such flowing is shown on the grandest scale known to our present experience (whatever may have happened in the mighty workshops of geological science) in the glaciers of the Alps, where great masses of solid ice flow slowly down their confining channels, changing their shape of cross section as needs be without being crushed or suffering any disintegration of their substance. This has been well described by Professor Tyndall, and it is, if I remember rightly, the same distinguished prowler about Nature's portals who tried the very interesting experiments regarding the flow of foreign objects through solid pitch without leaving any holes in it. I could not find the description of this experiment the other day in any books that I had at hand, but I believe it was as follows: A number of stones were placed upon the top of, and a number of corks underneath, a mass of pitch several inches thick, and abandoned to their fate. After several months of silent disappearance the corks arrived at the top and the stones at the bottom of the pitch, having floated and sunk respectively to their natural destinations.

"In looking for the flow of solids in the metallic arts it will be well to omit all hot processes as dealing with semi-fluids; but familiar examples of cold flow may be seen in wire drawing, tube drawing, cold rolling and hammering, lead pipe making, sheet metal spinning, &c.

"The first two mentioned are obviously analogous, about the only difference being that the tube is hollow, usually with a mandrel inside of it, while the wire is solid. Very similar to these operations, as respects the direction of flow of the particles of metal, is the reducing of a rod in grooved rolls, the chief difference being that the metal is coaxed along by friction, so to speak, instead of being pulled by its finished end. In hammering a bar the tensile stresses are entirely omitted and the action is wholly compressive, in a lateral direction, of course.

"In lead pipe making we have also an entirely compressive action, but one very different from that in the last named process. Here the lead is squirted out, as it were, much after the manner of a syringe, or a sausage stuffer, or one of those curious but really excellent squirting brick machines. . . ."

In Fig. 236 is shown a pair of conical drawing dies, the blank and successive stages of the work being shown respectively in Figs. 237, 238 and 239. Perspective views of finished work from dies of this sort are shown in Figs. 254 to 257, inclusive. Large sized dies of this kind are usually made of cast iron, without cutting edges, the gauging being done by hand as before mentioned. Where there is considerable taper to the work, it is removed by the hand of the operator grasping it inside and lifting it merely by friction as he pulls it upward and sidewise. The presses for

doing this are run very slowly, with continuous strokes, not stopping by the clutch with the ram in up position, as is usual with smaller presses. This is, of course, somewhat dangerous, as a man's arms would be crushed to a jelly were he to fail in keeping time with the motions of the press, even perhaps by the fraction of a second. It is rarely, however, that accidents of this sort happen.

cause it to stick fast and thus prevent a free delivery. In Figs. 258 and 259 are shown perspective views of a bowl and cup made in dies of this sort.

Depth of Drawing.

The depth of work attainable by the drawing process depends upon various conditions, among which are the kind and toughness of metal, the thickness thereof in proportion to the diameter, shallowness which are sometimes very provoking. Silver and gold are well adapted for deep work, but I cannot learn of the latter metal having been tried for anything as large as a churn. Recent experiments in the drawing of aluminum show it to be well adapted to the process. It is especially convenient on account of working without so frequent annealing as is necessary with brass, iron and steel, &c. Its tensile

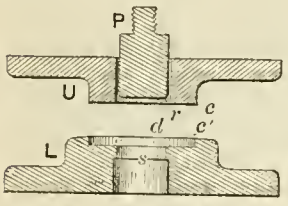


Fig. 231.

Fig. 232.

Fig. 233.

Fig 234.

Fig. 235.

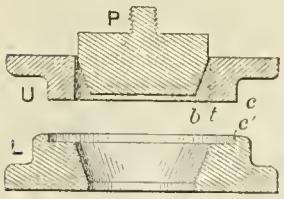


Fig. 236.

Fig. 237.

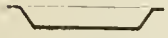


Fig. 238.

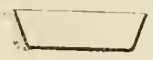


Fig. 239.

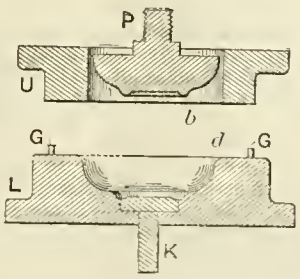


Fig. 240.

Fig. 241.

Fig. 242.

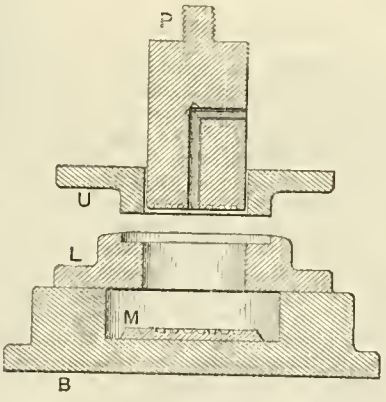


Fig. 243.

Fig. 244.

Fig. 245.

Fig 246

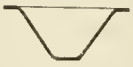


Fig. 247.

Fig. 248.

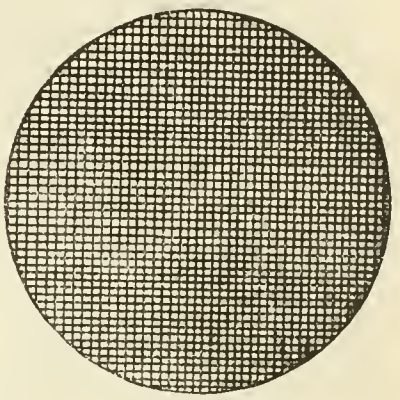


Fig 2 9.

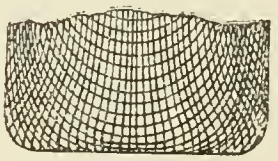


Fig. 250

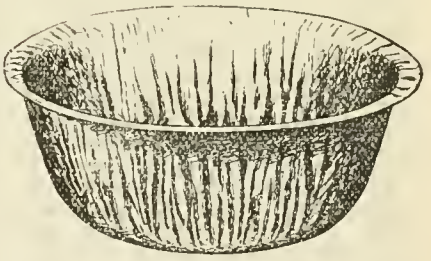


Fig. 251.

Fig. 252.

Fig. 253.

Fig. 254.

PRESS WORKING OF SHEET METALS.

In Fig. 240 is shown a somewhat similar pair of dies, except that they are provided with a knockout, K, which rises at the proper time by a spring, or automatically by the motion of the press. Such knockouts are of course used in dies of either of the forms described and they are sometimes omitted in the bowl shaped work (see Fig. 242) made in the dies now under discussion. The necessity of such a knockout is of course dependent upon whether the work is steep enough at any place to the smoothness of the dies, &c. I have known small articles to be drawn at one operation from a good quality of one cross tin plate, which is about $\frac{1}{64}$ inch thick, to a depth equal to one-half their dismeter. Occasionally this proportion has reached two-thirds, as for instance a 3-inch round box 2 inches deep, &c.; but such would be an extreme case. Brass, German silver and copper can usually be drawn somewhat deeper, while zinc, on account of its tensile weakness, has limitations of strength, however, being somewhat less than brass, prevents so great a depth being obtained at one operation. In some experiments conducted by the writer in drawing cartridge shells of this metal, it showed itself most excellently adapted to the purpose, as it is also to all sorts of cooking utensils, which are drawn without difficulty in the ordinary forms. These, on account of their healthfulness, lightness and beauty, are, I think, destined to undergo an enormous development.

To quote again from the lecture before mentioned and referring to Fig. 231:

"A little study of the work which is being done in a die like this will show why a limit of depth is soon reached. The actual work consists, firstly, of molecular friction, or the causing to flow among themselves of the particles of metal in the flange before it turns the corner *d;* and secondly, in overcoming the friction between the upper and lower sides of the metal and the flat surfaces of the dies. If we imagine the part of the work which has become cylindrical to be a series of little ropes (forming the elements of the cylinder) which are attached to the punch by running across under the bottom of it and thence up its sides to the corner *d*, we will see that all the resistance offered in the flange is being overcome by the punch pulling these ropes downward over the corner *d*, it acting as a stationary pulley block. Hence if the united tensile strength of all these little ropes is great enough to overcome the resistance at its maximum, which is soon after the metal begins to flow, when the flange is at its widest, perfect work will be the result. If, however, there are not enough ropes to do this work, which is the case when the diameter at *s* is too small, the flange will not start to move, but the punch will simply go down and tear the bottom out of the work. Thus if we try for too great a depth relatively to the proposed diameter the work will be spoiled, because this means a wide flange and more resistance.

"It is evident that the little ropes spoken of will render more easily about a large corner than a small one, and that therefore a better result may be obtained by increasing the radius of the drawing corner *d*. If, however, this is carried too far, a considerable part of the flat holding surface of the lower die is lost, and a new evil arises, known as body wrinkles, which will be explained further on. Practically, for working tin plate, the radius of the corner *d* is made from $\frac{1}{8}$ to $\frac{1}{4}$ inch. The curvature of the corner *r* upon the punch also affects the result. If it is made perfectly sharp it tends to cut the metal which is pulled around it, and practically ought not to be less than $\frac{1}{16}$ inch radius. It is often much larger than this to suit shape of work desired, but if made very large causes the trouble of body wrinkles before referred to, on account of there being a certain zone of the blank which is unconfined by the flat holding surfaces."

In conical work like Fig. 239, or with approximately spherical shapes like Fig. 242, the blank is evidently unconfined over a certain annular zone lying between the lower corner of the punch *b* and upper corner of the lower die *d*, represented in general by the distance *b t*, Fig. 236. As the inner portions of the flange enter this zone and pass inward over its surface they are obliged to become smaller in circumference. There are here no clamping die surfaces to prevent wrinkles, which are therefore naturally formed and carried down into the conical portion of the work, as shown in Fig. 251, which was photographed from an actual wash bowl about 10 inches diameter just as it left the dies. These are known as "body wrinkles," in contradistinction to the flange wrinkles which sometimes occur when the upper and lower dies are not set tightly enough together. The former are usually removed by roller spinning in a special lathe. They are apt to occur in almost any of the utensils shown, except perhaps in work like the pie plate, Fig. 254. This is so shallow that they only barely begin to form, especially as the flange can be clamped very tightly in proportion to the depth, so that there is a tendency to pull out these incipient wrinkles by the actual stretching of the conical body of the work. There are other cases where wrinkles do not form objectionably on account of the work having very little taper, as in Fig. 257.

In Figs. 252 and 253 are shown common forms of cake pans, which illustrate body wrinkles when systematized and intended purposely to remain. These are the easiest made of all forms of deep work and do not require a holding die at all, being made without trouble in a single action press.

In conical work the difficulty in regard to getting enough tensile strength of metal to pull in the flange is often greater than in cylindrical, as the hypothetical little ropes spoken of in the above quotation are still fewer in number around the small circle whose perimeter is at *b* than they would be in the larger one at *t*, with a cylindrical punch. In general, therefore, work with a diameter at the bottom small in proportion to the extreme diameter of the flange is difficult to draw. This is shown in Figs. 246, 247 and 248, where there is a great deal of work going on in the vicinity of the flange in comparison to the amount of strength around the point of the punch to do the pulling.

Multiple Drawing.

It is evident that the resistance to be overcome in this process is due to both surface friction and molecular friction, or resistance to flow. With such conical articles as bowls, pans, &c., which do not require to be absolutely of uniform size, advantage is taken of this division of friction by drawing two or more together—sometimes as many as four. In such a case the surface friction is no greater for four than for one, as there are but two surfaces sliding against the dies. The molecular friction is, of course, four times as great as with one, but the sum of these frictions is obviously less than with one in proportion to the tensile strength of the work around the punch, which is as the number of thicknesses involved. There is, therefore, a considerable gain in strength, and deeper work may be made than where one is drawn at a time.

It is customary to remove the several thicknesses together from the press, sometimes spinning them in this condition, after which they easily drop apart. Obviously this could not well be done with cylindrical articles, as the difference in diameter would be too apparent, and, moreover, they could not be easily separated.

Referring again to the condition of the dies, it is very necessary, in order to avoid surface friction, that they be made exceedingly smooth and that the flat surfaces should be truly parallel, thus giving a space of uniform thickness between them. It is better to polish the clamping surfaces radially, rather than to leave a lathe polish upon them—a quite perceptible difference in preventing the metal from cracking sometimes appearing under such conditions.

Lubrication, which in certain cases is needed with various other kinds of dies referred to in this treatise, is always necessary to a more or less degree in drawn work. Sometimes oil is the best material — either applied occasionally to the dies or smeared in a thin coat over the sheets or blanks, or some of them. Soap suds works well for brass, and there are a variety of special preparations in the market. Zinc draws better if warmed as well as lubricated.

In Fig. 243 are shown a pair of triple action dies, and in Figs. 244 and 245 a blank and a finished box lid made therein. The action of these is the same as in Fig. 231, except that the punch has relatively a longer stroke and carries the work down on to the embossing matrix M, which is fastened at the bottom of a special bolster, B, made with an opening at the back through which the work is removed, instead of dropping downward in the ordinary way. The object of this is to emboss panels, beads, lettering or other devices upon the bottom of the work, and yet not be obliged to knock it up through the die, which is difficult with cylindrical shaped articles. The removal spoken of is usually performed by gravity, the press being set in an inclined position, so that the work may freely slide out. Sometimes, however, an automatic push out is provided. This is safer, as gravity sometimes fails to do its duty at a critical moment. Presses built especially for such work usually have a shorter ram stroke than usual, as room is not required between the dies for knockout work, and a relatively longer plunger stoke is needed, so that the die L may be made unusually thick (to give it strength where it bridges across the open space in bolster), and yet that the punch may descend far enough to reach through it and downward to M. The punch itself is of course unusually long.

It is evident that other shapes (looked at in top view) than round may be treated by the drawing process. In Fig. 276 is shown a rectangular sardine box, whose sides are straight and corners rounded to about $\frac{1}{4}$ inch radius. This is quite difficult to draw, because the action upon the metal at the corners is approximately the same as in drawing a cylindrical box with the same radius, or $1\frac{1}{2}$ inches in diameter, which is very small considering the depth attained. There is in such case a violent flow of metal, modified somewhat as it extends outward from a rounded corner into the two adjacent straight sides. The shape of the blank for work of this kind is rather peculiar, the corners being very much cut away in comparison with the sides to allow for the great radial stretch of metal at those points. The turning up of the sides along near the middle thereof is obviously a bending action merely. In Fig. 260 is shown an oblong pan with rounded ends, which is of somewhat the same nature as the box just mentioned.

In Fig. 261 is shown a grocers' scoop, which was drawn in an irregular die, the flange and a part of the body being trimmed off afterward.

In Fig. 262 is shown an ordinary wash boiler bottom, illustrating a case where no special blank is purposely prepared, but where the so-called "well" or depression is drawn in an ordinary rectangular sheet of metal, the holding surfaces of the dies of course being large enough to cover it. This system is sometimes used in producing certain tin toys, where the two halves of an animal are thus drawn and trimmed and then soldered together along the spinal column, &c.; also for various other similar shallow work. Its advantage is that no cutting dies are needed except for trimming off a part or all of the flange after drawing, which dies would have to be furnished in any case.

In Fig. 263 is shown a pair of combination spring drawing dies, so called, with the blank they cut shown in Fig. 264, and other stages of the work shown in Figs. 265 and 266. In Fig. 267 is shown a pair of similar dies arranged to work from a pre-cut blank, Fig. 268, and not supplied with cutting edges. The work is shown part way drawn in Fig. 269, and completed in Fig. 270.

Such dies are used in single action presses, the flange pressure being supplied by the drawing ring A, which is driven up and against die U by a powerful spring, S, working against a sliding plate, P, through the medium of a series of pins, B B. The stem D, together with its plate, P, nuts, N, spring, S, &c., form a portable device sometimes known as a "spring drawer," which can be screwed into any die adapted for it. Work done in this way is generally limited in depth to about 1 inch, as the pressure with anything much deeper would be so enormous as to waste a great deal of power, the descending ram having, of course, to compress the spring to the same number of pounds as are afterward given out by it upon its ascent.

Blank Dimensions.

In regard to the important matter of blank dimensions, I will again quote from my Franklin Institute lecture, as follows:

"It will naturally occur to the student of this subject that some easy tentative one. It is the surest, but in many cases the most expensive. It consists in cutting blanks of as near as possible the right size and shape by guess and trying them successively, modifying the shape of each to suit circumstances until the proper shape of drawn work is produced. For dies that do not cut this is not difficult, as the flat holding surfaces can be made plenty large enough, and whatever gauging arrangements are to guide the blank

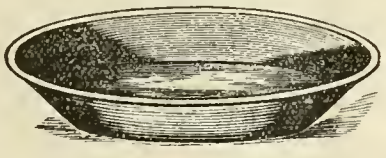


Fig. 255.

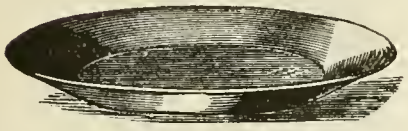


Fig. 256.

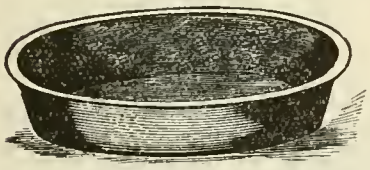


Fig. 257.

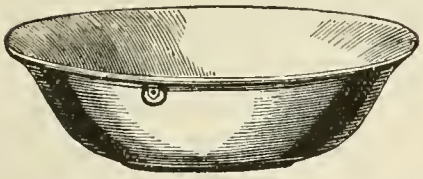


Fig. 258.

Fig. 259.

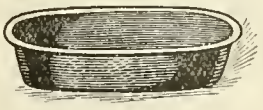


Fig. 260.

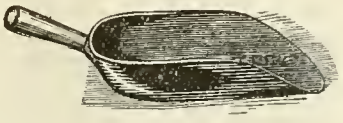


Fig. 261.

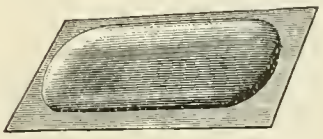
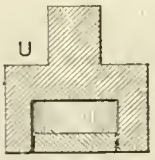


Fig. 262.



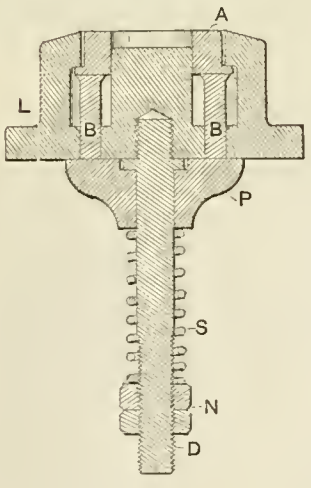


Fig. 263.

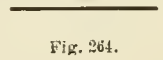


Fig. 264.

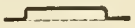


Fig. 265.

Fig. 266.

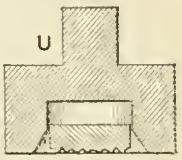


Fig. 267.

Fig. 268.

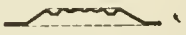


Fig. 269.

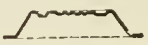


Fig. 270.

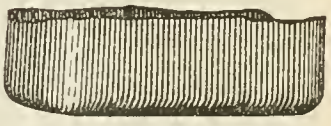


Fig. 276.

PRESS WORKING OF SHEET METALS.

method is desirable for determining the diameter of the blank for any given piece of drawn work, especially if its dies are to cut, as cutting edges are expensive to make—and to alter if guessed at and made wrong at first. Aside from lucky guessing, somewhat guided, perhaps, by analogies from other approximately similar work that dies have been made for before, I have in my own practice used three principal methods to obtain this measurement of blank diameter.

"The first of these methods is the can be put on afterward when its correct proportions are decided upon. In cutting dies, the female cutting ring must be made separately, and left unfinished until the size and shape is ascertained. The male cutting ring, which forms part of the upper holding surface, must of course be made, but can be left plenty large enough until this trial has been completed.

"The second method referred to may be called the 'gravitative.' It depends for its accuracy upon the principle that the thickness of the metal in a piece of

drawn work is the same as it was in the original blank, which is in fact usually the case. My own method is to carefully weigh the sample piece of drawn work which is to be reproduced, and then, knowing the weight of 1 square inch of a piece of similar sheet metal of exactly the same measured thickness, to calculate the number of square inches necessary in the blank and make its diameter to suit this given area. This method can obviously be practiced only where a sample of the work is at hand and where the blanks are circular in form. Certain inaccuracies may arise in the practice of this method, where there are sundry beads, corrugations, &c., near the center of the piece of drawn work, which tend to let the metal stretch when the punch comes home in the die. Such action is properly embossing, rather than drawing, and stretches the metal thinner in certain places, which, of course, invalidates the accuracy of this system. It is, however, often useful for work whose contour is simple in form near the central portions, where a drawing action does not take place.

"The third method spoken of may be called the 'mensurative.' This, too, depends upon equal areas and upon the thickness of the metal remaining the same. In the case of plain cylindrical work a very simple formula which I have worked out for the purpose may be used. This is given in diagram A, equation 3, for a box or cup whose corner at m is sharp or nearly so, and in equation 6 for a round cornered box. The latter formula is not theoretically accurate as regards equal areas, but serves an excellent practical purpose where the corner is not of too large a curvature—say with a radius not more than one-fourth the depth of the cup. The diagram given in diagram A is a vertical axial section of a cylindrical box or cup, the same as was shown in Fig. 235. It is not worth while here to give the working out of the formulæ, as by a close inspection the figures will explain themselves.

"In diagram B is shown a method which I have devised for ascertaining the area of a piece of drawn work of irregular contour as regards its vertical section. This method is a graphic one, an exact profile of the work being drawn to scale of real size and this contour line being laid off from its axis outward into sections, each exactly $\frac{1}{8}$ inch long. From the centers of these sections, at the points marked r', r'', r''', &c., horizontal measurements are taken to the axis. These measurements, of course, represent various radii of the piece of drawn work in question. If we let the sum of them be called s, we then get the very simple formula given in equation 3. The reason that just $\frac{1}{8}$ inch was taken for the length of these segments of the contour line was that it happened to reduce the equation to the simple form given, while any other length would have made it more complicated. The principle here involved is obviously that of the area of any zone, being its width multiplied by its circumference at a point representing the center of gravity of its single cross section. The points marked r', r'', &c., are, of course, not accurately in the center of gravity of each of the little segments, but they are practically near enough so. The same principle occurs in this method as in the last mentioned one regarding places in the metal which will stretch thinner when formed to shape, like deep beads or other indentations. This trouble may be mostly neutralized, however, by bridging over them, so to speak, in making the contour line—that is, by running the latter across from point to point of the corrugations instead of following their curves wherever it is judged that stretching will take place. This amended contour is shown at n, n, diagram B, by dotted lines, and on it the segments should be laid out.

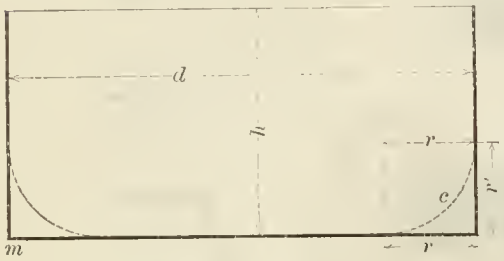
"In making drawn work whose top is elliptical instead of round, the formulæ above given may be used with some modifications.

"To do this, the ellipse is treated separately as regards its short and long axes, and values are inserted in the two equations which would be used for circles, which approximately coincide with the sides and ends of the ellipse at the termini of its respective axes.

"In making rectangular work with round corners, some idea of the shape of the blank may be obtained by treating the corners as belonging to a circle of the proper diameter, while the sides of the rectangle, which properly are not drawn at all, but only bent to shape, may be treated nearly by actual measurement, as in them very little stretching takes place. As regards the corners, however, the tentative method is the safest wherever it is possible to use it."

But few available data exist, or at any rate have been made public, regarding pressure per square inch necessary for holding the various kinds of metal between the surfaces of drawing dies. Neither do any proper testing instruments exist which will fill all the conditions present. These must be originated, and it is certainly very desirable that somebody should make a systematic series of experiments in connection with this matter, as well as in relation to the pressures in general that are used in sheet and bar metal work. Such experimenta, if properly performed, are tedious and expensive, but the writer hopes at some future time to be able to publish something definite upon the subject. Some fragmentary experimenta which he made a few years ago show about 200 pounds per square inch for holding the flange of a small milk pan, over 300 pounds upon a blacking box in one case and nearly 500 pounds in another. One such box, with less than $1\frac{1}{2}$ square inches of drawing surface, stood over 4000 pounds without the bottom being punched out, showing that in such shallow work there is often a great excess of flange strength. In general, for small tin plate work the pressure will probably run between 200 and 400 pounds.

The greatest possible plunger pressure that can be used in any given case without breakage is, of course, measurable by the tensile strength of the cross section of the work at the smallest diameter of the punch. This strength is obviously found by multiplying the circumference of the work at that point



Let (in inches):
d = diameter of cup.
h = hight of cup.
r = radius of corner.
c = arc of 90°, with radius r.
a = area bottom + sides.
a = area blank, also.
x = diameter blank is to be cut.

$$a = 0.785\,d^2 + \pi dh \quad (1.)$$

$$x = \sqrt{\frac{a}{0.785}} = \sqrt{\frac{0.785\,a^2 + \pi dh}{0.785}} \quad (2)$$

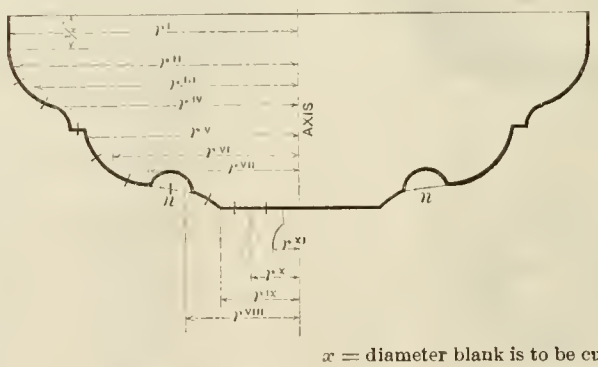
$$x = \sqrt{d^2 + 4dh}, \text{ for sharp cornered cup} \quad (3)$$

$$r' + r'' - c = \frac{r}{2} - \quad (4.)$$

$$2 = (r' + r'') - 2c = r - \quad (5.)$$

$$x = \left(\sqrt{d^2 + 4dh}\right) - r, \text{ about, for round cornered cup; with small corner, say where } r < \frac{h}{4} \quad (6.)$$

Diagram A.



Let (in inches):
r^{I}, r^{II}, r^{III}, r^{IV}, &c., = radii drawn to axis from centers of gravity of $\frac{1}{8}$ inch segments of contour line.
$s = r^{\mathrm{I}} + r^{\mathrm{II}} + r^{\mathrm{III}} + r^{\mathrm{IV}}$, &c.; that is, the sum of the radii.
a = area bottom + sides.
a = area blank, also.
a^1 = area of one zone whose average radius is r^{I}, r^{II}, r^{III}, &c.
x = diameter blank is to be cut.

$$a' = 2\,r^{\mathrm{I}}\,\pi\,\tfrac{1}{8} \quad (1.)$$

$$a = 2\,s\,\pi\,\tfrac{1}{8} = 0.785\,s \quad (2.)$$

$$x = \sqrt{\frac{a}{0.785}} = \sqrt{\frac{0.785s}{0.785}} = \sqrt{s} \quad (3)$$

Diagram B.

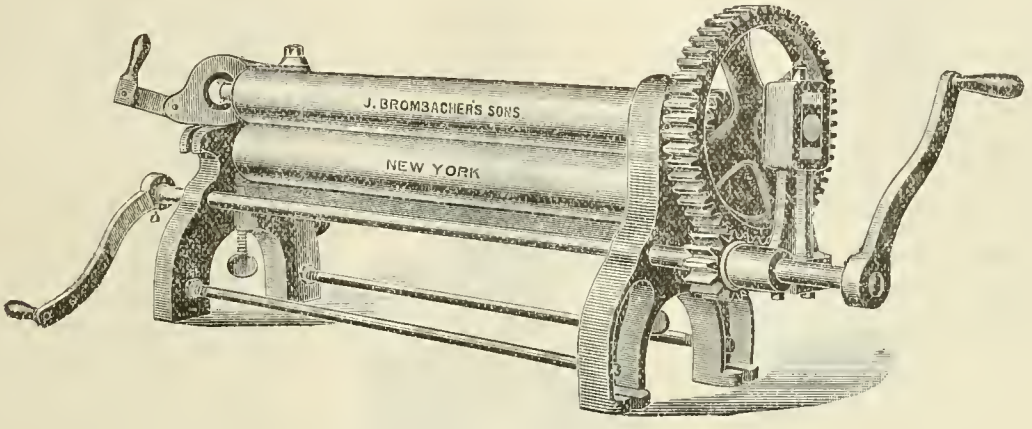
by the thickness of the metal and by its ultimate tensile strength per square inch. Or, P = SWT, our old formula with a new application.

In regard to the maximum limit of punch speed in drawing, we have again but few reliable data. The number of strokes per minute of drawing presses in commercial use vary from 10 to 200, with perhaps a rough general average of 50 or 60 per minute. At these rates the various metals used seem to flow properly without tearing fracture, although it may be that in some cases a slower speed would produce better results. Here, again, some systematic experiments are very desirable.

In regard to the kinds of presses used for such work, the general motion required has been before described. The plunger motion is almost always produced by means of a crank and pitman. The ram motion also is sometimes obtained this way in the case of certain kinds of shallow work, especially in brass factories. The dwell for the purpose of holding the flange of the work is obviously in such case but an approximate one, but if the metal is not too thin it seems to answer the purpose in the cases referred to. The majority of drawing presses are arranged to work the ram during its downward stroke by means of cams. These, if properly made with enormously strong shafts and rollers, with amply large bearing surfaces and of proper material, are very efficient and durable. The lifting of the ram is sometimes positively done by cams, and sometimes by non positive devices, such as springs and weights, or steam, air and water pistons, working in appropriate cylinders, &c. Any of these devices, if properly designed and adapted to the speed of the press, are sufficiently good for the purpose. In cases where the ram carrying the upper die (or blank holder, as it is often termed) is reversed, doing its clamping in an upward instead of a downward direction (as is the case in some large bottom slide presses), the direct action of gravity is used to return it. This gives excellent results, and an exceedingly simple construction can be obtained. Another device which has come into rather extensive use consists essentially of a system of toggle joints intervening the ram and the press frame, which hold the ram securely clamped, with its die against the flange of the work, without bringing a running pressure upon the shaft and roller bearings, as is the case with cam presses. This is obviously an advantage, but there is considerable difference of opinion among press makers and users as to whether any such advantage compensates for the additional complication required, especially after several years' wear has taken place. In general it may be said that any of the plans mentioned are practically good enough if properly designed.

Improved Slip Roll Pipe Former

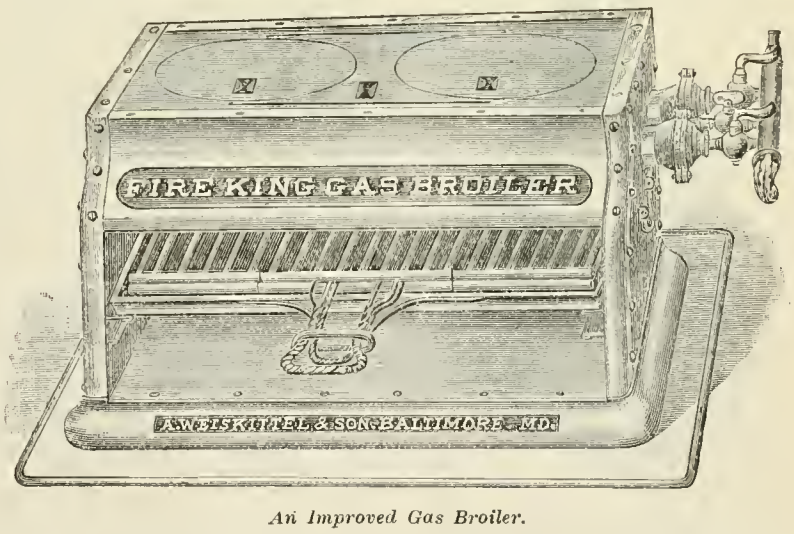
Jacob Brombacher's Sons, 30 Cliff street, New York, are bringing out an improved pipe former as here shown. The superior merits of this machine are pointed out by the manufacturers as follows: The upper or slip roll rests at the geared end in two fixed bearings, making it less springy than if hung on a screw. The other end of the slip roll is supported by a solid box, instead of an upper half box, thereby relieving the other two bearings of much undue strain. The slip roll bearing is removed from the shaft by sliding it sideways instead of swinging it upward, while the mechanism is so arranged that it at the same time lowers the under roll in order to allow the formed pipe to be removed. An advantage referred to is that this construction allows the workman to remain at one end of the former, instead of going to the other side, to lift the slip roll by means of a screw. The pinion shaft runs through both side frames and has a crank on each end, thus increasing the power. This machine can be supplied in sizes ranging from 3 to 4½ inches diameter of rolls, the length of which may be anything up to 60 inches. The machines are geared 4 to 1, and are capable of rolling up No. 12 gauge iron. They can be furnished for either hand or power.



Improved Slip Roll Pipe Former, Hand or Power.

An Improved Gas Broiler.

We present in the accompanying illustration a general view of an improved gas broiler which is being offered the trade under the name Fire King by A. Weiskittel & Son of Baltimore, Md. This broiler is of a size suitable for family use, being provided with two cooking holes on top, so that boiling and broiling may be done at the same time with the same burner. The manufacturers call attention to the fact that as the broiling is done beneath the flame the juices of the meat cannot drop into the fire and that the broiling is done quickly and uniformly. The claim is also made that meat cooked with the Fire King gas broiler retains all its juices and is more palatable than when broiled in the ordinary way. The sides, bottom and back of the broiler are made of heavy sheet steel, and the frames, base, &c., are highly polished. The broiler is 20 inches wide and 14 inches deep at the base, and measures 10¾ inches in hight. A wire broiler, 12 x 15 inches, and a drip pan accompany each broiler.



An Improved Gas Broiler.

The first American vessel to pass through the Manchester Ship Canal was the "Ambrose," with a cargo of oil from Philadelphia.

The gold coinage executed at the Philadelphia mint in the fiscal year ending June 30 will, it is said, be by far the heaviest in the history of that institution, approximating $80,000,000. The largest previous record was in 1861, when the gold coinage was $67,588,000.

PLUMBING and GAS FITTING.

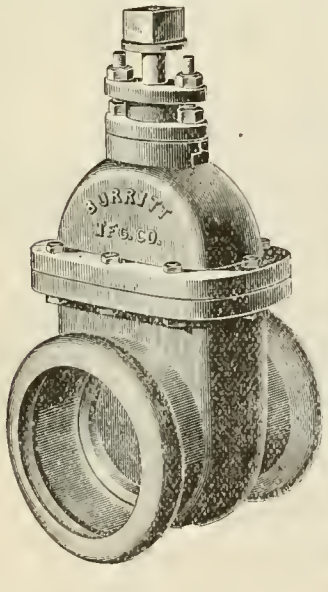
Plumbers' Convention Delegates.

The following delegates were elected to attend the national convention at the annual meeting of the Association of Master Plumbers of Brooklyn, N. Y.:

E. Heyward.	Wm. J. Gault.
Geo. Cummings.	Thos. H. Radcliffe.
Martin Fallon.	Walter Coyne.
R. J. Knox.	P. M. Moffatt.
G. B. Lewis.	C. F. Mentzinger.
J. W. Kelly.	Thos. Kelly.
Willis Gardner.	C. W. Evans.
J. J. Keenan.	B. McBride.
Wm. Eiermann.	H. M. Noble.
Jos. Zoll.	J. Quatlander.
O. O. Sawkins.	M. F. Gleason.
E. Macdonald.	Louis Haaf.
G. W. Smythe.	John H. Read.
Geo. Meng.	G. A. Smith.

Roller Wedge Gate Valve.

The illustrations shown herewith present a new gate valve recently put on the market by the Burritt Mfg. Company of the Havemeyer Building, 26 Cortlandt street, New York. The company have large works at Bound Brook, N. J., where these goods are manufactured. Fig. 1 shows the valve complete and Fig. 2 is a sectional view. The valve is the invention of O. W. Burritt, who for a number of years was superintendent of the Water Works Department of the city of Newark, N. J., and was devised as the result of the stems of the gate valves used on the city system fre-



Roller Wedge Gate Valve.—Fig. 1.—Showing Valve Complete.

quently breaking in the endeavor to open or close the valves. The valve consists of two disks operating in connection with an expansion wedge, securing a free and anti-friction movement by means of non-corrosive balls moving in inclined recesses between the wedge and disks. As the disks in common with the wedge move downward, the wedge is stopped by lugs cast in the shell, while the disks travel on and expand to a perfect shut off, it is said, regardless of sand or sediment collected in the bottom of the shell. In opening the gate the balls moving in the inclined recesses cause the wedge to yield at once on the motion of the screw, and the disks relieved of all forward pressure respond to the touch of the wrench. The shell of the valve is made with a smooth

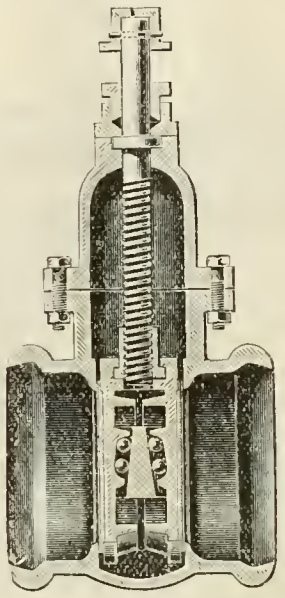


Fig. 2.—Sectional View.

face for the disks to shut against, and the disks are made with a babbitt metal face or brass face, according to the use to which they are put. For gas the valves are made with a brass stem, and brass is used on the faces of the disks instead of babbitt metal, which prevents the corrosion which otherwise would fasten the parts together. For steam the valve has a peculiar advantage in that it may be packed at the stem when the valve is open, as the top of the socket into which the screw is fastened is made conical and a recess is made in the top of the valve shell, so that the space around the stem is closed while the collar is removed and new packing put in. The ease with which the valve may be opened after it has been shut as tight as possible is a feature that has attracted the attention of all who have seen it. A large number of these valves have been sold to the Niagara Construction Company, Niagara, N. Y., and they have attracted the attention of water works engineers in cities where particularly heavy pressures are carried. The valves are now made in sizes from 2 to 12 inches and later will be made in all regular sizes up to 48 inches.

Smith & Webster.

About two years since, in the belief that there was room for another plumbers' supply house, the firm of Smith & Webster was formed in Chicago. The members of the new firm, Edward C. Smith and William M. Webster, both had a practical knowledge of the business, with years of experience in both manufacturing and selling plumbers' supplies. They started in a modest way, but met with encouraging success and added one department after another until it became necessary to secure larger quarters and acquire much greater manufacturing facilities. For this purpose they recently secured the building extending from 15 to 21 North Clinton street, Chicago, in which they concentrated their manufacturing and sales departments. They have pushed the work of equipping the factory as rapidly as possible, but still have important projects in hand which are in process of completion. The firm are highly gratified with the manner in which their enterprise is being recognized by the plumbers, whose patronage is steadily increasing and keeping pace with the improved facilities now enjoyed.

The building occupied is four stories in hight, with a fine basement. It originally consisted of a front and back building, separated by an area or court. This court is now inclosed and occupied by a two-story structure, of which the second story is used for office purposes, to which it is admirably suited. Side windows and skylights pour a flood of light into it, while from it all parts of the storeroom in front and the shipping room in the rear are visible. The storeroom and shipping room occupy the whole of the first floor. The storeroom is conveniently arranged with racks running transversely across the room, with a passage way down one side for customers. The shipping room in the rear opens on a roomy alley, and is also fitted with racks in which small wares are kept that are in greatest demand. The basement is used for the storage of pipe and fittings, bathtubs and other bulky or weighty goods. Machinery is about to be installed here for the manufacture of copper lined bathtubs. A portion of the basement is used for an engine room, in which is a 250 horse-power Reynolds Corliss engine, driving the machinery of the entire establishment. Near it is a dynamo, used for electric lighting and to supply current for the plating department.

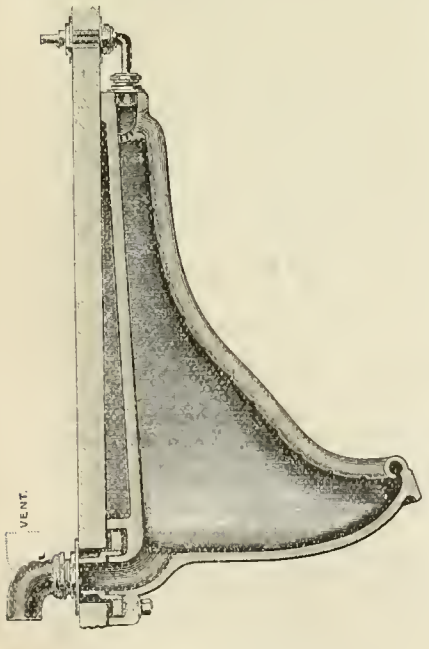
On the second and higher floors are the several manufacturing departments. One of these is the marble room, in which marble slabs imported direct from Italy are cut, shaped and polished for all purposes in connection with plumbing. Machinery plays an important part in this work. The most notable machine now in use here is Riehlé Bros.' countersinking machine. A pneumatic cutting machine for decorative work is now being added, and steam polishers are shortly to be introduced. In connection with the marble room is the department for manufacturing laundry tubs, which is fitted up with appliances for making tubs of slate, soapstone and granite. In the cabinet shop the firm make all their own wood work, such as rims for bathtubs, closet tanks, closet seats, &c. The lumber is bought in the rough and the goods are turned out complete, even the tanks being lined on the premises. A brass foundry is on the top floor, which is fitted with a brick pavement and otherwise rendered fire-

proof. Three furnaces are regularly run and capacity is afforded for three more. The firm thus turn out all their own brass castings and in an adjoining room finish them up on lathes and special machines, including polishers and buffers. Everything is carefully tested before it goes into stock to insure good work. Tables of the water pressure in all cities and towns are kept for constant reference, and whenever goods are ordered for points having very high pressure they are made accordingly and tested to withstand much greater strain. An extensive plating room is an adjunct of the brass foundry, in which plating is done in nickel, silver and copper. A well equipped forge and tool room enables repairs to be promptly made to machinery, tools to be quickly sharpened, and much machine work to be turned out exactly suited to the special requirements of the business. Two elevators are in constant service, one in front and the other in the rear of the factory.

The location selected is admirably suited to the business transacted by this firm. They are in the immediate vicinity of the lead pipe manufacturers and other makers of plumbers' supplies, close to railroad depots and warehouses, in the heart of the city and yet in a manufacturing district. They are thus near their city customers, near their base of supplies, and well situated for the out of town trade at the same time. They are jobbers as well as manufacturers and are thus prepared to furnish anything needed by a plumber.

Perfecto Urinal.

The illustration presented herewith shows the Perfecto urinal which is being put on the market by Fred Adee &



Perfecto Urinal.

Co., 90 Beekman street, New York. It is made of vitreous ware, which it is said will not craze, the material being of the same character all the way through and non-absorbent. It is said that this ware will stand the sudden heating and cooling with the contraction and expansion to which a urinal is subjected without crazing. The back of the urinal is inclined to facilitate the wash, and the flushing rim so arranged that all parts of the bowl are thoroughly scoured. The back is ground flat so as to fit close to the slab to which it is attached. The top connection is made by means of a flexible rubber union which provides for expansion and contraction. The waste outlet at the bottom is so arranged that all the pipe can be attached to the slab and the urinal connected at the last moment, and may be readily removed in case it is necessary to do so for repairs.

A Growing Dubuque Enterprise.

One of the busiest foundries in the city, says the Dubuque (Iowa) *Times*, and where from 90 to 100 skilled laborers are constantly employed, is the Excelsior Brass Works, whose goods are handled by all the leading jobbers of the country and the business of which has increased to such a magnitude that it can be justly rated as one of the leading industries. The gentlemen at the head of this business are all well-known citizens, and the new life and energy infused in the business but reflect their aggressive methods. The officers of the company are: President, A. W. Hosford; vice-president, A. E Kemler; secretary and treasurer, J. W. Waters; general manager, P. R. Martin. These gentlemen, together with P. H. Halpin, comprise the board of directors.

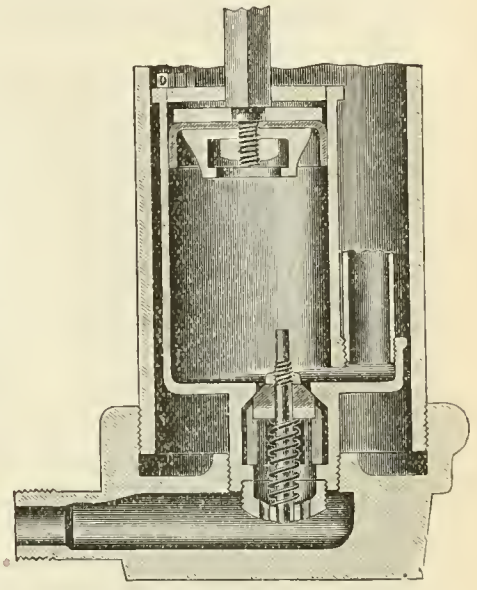
This company were incorporated in 1892 and in a manner succeeded to the business of Hodge & Waters, who had been in the business for some years, and with renewed capital and an infusion of new blood have enlarged the business and adopted new specialties, making their lines now complete and attractive. They manufacture a full line of plumbers' and steam fitters' supplies and make a specialty of brass castings and nickel plated goods.

Despite the fact that this company are comparatively young, the quality of their product has given them an enviable reputation wherever the goods have been sold. They keep in their employ three traveling salesmen who only look after the jobbing trade, and a first-class demand for their goods has been created in nearly all parts of the country. It may seem strange to be told that a Dubuque factory with but two years' opportunity to build has already secured a clientage that extends from the Atlantic to the Pacific, but such is the case with the Excelsior Brass Works, and their trade is reaching proportions which are highly gratifying to the management.

An innovation has been made at this factory which is at least novel and which frees it from the fear of coal strikes and permits a saving of a large amount in fuel alone. It is the only factory in Dubuque using crude oil for fuel and it is also used for foundry purposes. The manager reports that this substitute for coal works more than satisfactorily.

Type C Non-Wasting Hydrant

The cut presented herewith shows the principle and operating mechanism of the Type C Non Wasting hydrant made by the Ette & Henger Mfg. Company, St. Louis, Mo. The valve closes with the pressure as shown. It is not hung to the grating rod and is, it is claimed, perfectly reliable even without the spring. When the hydrant is closed the valve rod is raised 4 inches above the valve by weight and pressure, and raises the 2½-inch pump cup washer in waste chamber, which permits all the water in the hydrant to enter this chamber, and in opening the hydrant this water is forced back into the supply pipe before opening the supply valve. The waste chamber has an area of double the waste water. The advantages of this hydrant which are alluded to are that, in addition to saving water, it overcomes the annoyance of having water ooze out of the ground



Type C Non-Wasting Hydrant.

in yard, lawn or cellar, to freeze in winter and make mud in summer. There is no chance, furthermore, for the gases of the earth entering the valve at the waste hole and impregnating the water.

TRAPS AND VENTS.

JOHN FORD, 62 West Broadway, New York, makes a specialty of the plumbing repair business in the downtown section of the city, and does quite a large contracting business in the uptown residence section.

GEORGE E. THOMPSON, formerly of Providence, R I., has purchased the business of the Newtonville Heating & Plumbing Company, Newtonville, Mass., and will continue the contracts of the same.

THE DAVIS & STEVENS MFG. COMPANY, Seneca Falls, N. Y., issue circulars and advertising matter relating to some of the specialties of their manufacture. One is a card illustrating and giving the chief features of the Tornado air pump for drawing beer or other liquids under air pressure, filling tanks and inflating pneumatic tires or for any other purpose. A second similarly describes the Cyclone pump, especially adapted for inflating pneumatic tires. Another circular is devoted to pump leathers, of which they manufacture all sorts, as well as washers for hydraulic and sanitary pumps. Cuts are shown of some of these articles and description given.

ELDRETH ARNOLD, an Auburn, Maine, plumber, is moving into the basement of Goff Block, at Lewiston, Maine.

THE NEW BOARD OF PLUMBING EXAMINERS of Holyoke, Mass., met and organized last week with Dr. G. H. Smith, chairman of the board of health, as chairman. The other members of the board are City Engineer Walther as building inspector and Dennis O'Leary,

a plumber. Joseph Murray, inspector of plumbing, is to be secretary of the board. Notices of the formation of the board and of the State law regarding registration and securing licenses will be sent to the plumbers, and applications must be filed on or before June 15. The law requires all journeymen and master plumbers who were not engaged in the business before June 10, 1893, to pass an examination before local boards before they can be allowed to do any work under a license.

THROUGH the courtesy of Eli Wardell, plumbing inspector of the city of Taunton, Mass., we are in receipt of a copy of the ordinances for the regulation of plumbing in that city.

S. G. DUNBAR of West Medfield, Mass., has purchased the interest of C. N. Black in the plumbing business at Belfast, Maine. The new firm will be Mitchell & Dunbar, and Mr. Dunbar being experienced in steam heating, it will be made a new feature of their business.

FRANK I. LESSARD & Co., the McGregorville plumbing firm, have opened a sample room at 1268 Elm street, Manchester, N. H., which contains a full line of plumbing specialties, stoves, ranges and furnaces.

BENJAMIN C. SMITH, 275 Pearl street, New York, who introduced the French Pipe Cutting Machine 18 months ago, for cutting off sections of water mains and smaller sizes of pipe, reports a very satisfactory business in this tool. In addition to having been adopted by a number of water companies in America, orders have been received from Christiania, Norway; Santos, Brazil; Bombay, India; Mexico, &c. This implement, described at length in these columns at the time of its introduction, makes a clean cut on wrought or cast iron pipe in a few minutes with two men, saving the remaining portion of the pipe, heretofore ruined in smashing out, not to mention the avoidance of leaks often started 100 or 200 feet away from shock.

JOHN PIERCE, JR., 43 Beekman street, New York, representative of the William S. Cooper Brass Works, is showing one of their new aluminum sinks. The sink weighs about 10 pounds, is 14 x 22 inches in size and 6 inches deep. It is provided with one of their patent detachable overflow wastes. The overflow stands 4¼ inches high and fits tightly into the sink outlet by means of a special rubber band. When not in use the waste hangs in a fork placed in an offset in the sink out of the way. The sink is as smooth and bright in appearance as a piece of polished silver.

THE NEWARK BRASS COMPANY, 164 166 First street, Jersey City, N.J., make a specialty of brass work for plumbers.

E. ASPINALL, 98–100 Beekman street, New York, has recently enlarged and rearranged his sample room. With a fresh coat of paint and a fine line of imported sanitary earthenware, it presents many attractions to the plumber. His porcelain baths are one of his special features. White porcelain lavatories, with splash boards, soap cup and sponge holder in a variety of styles and sizes, make a handsome line of plumbing fixtures. He is showing a variety of styles of the Unitas water closet, one of which is furnished with a rim, making it convenient when used as a slop sink. Another one of his specialties is Aspinall's enamel for bathtubs. This is used on copper lined bathtubs after the tinning has worn off. It effectually prevents corrosion and is not affected by change of temperature.

W. F. MCCARTHY, formerly with the Kewanee Boiler Company, has accepted the position of traveling salesman with the J. L Mott Iron Works, 311 and 313 Wabash avenue, Chicago.

H. L. SMITH, Southbridge, Mass., plumber, is to remove from the Dresser House Block to the store now occupied by C. H. Ullrich, Elm street.

ROBERT MAITLAND, Clinton, Mass., plumber, has removed his business to 91 High street, under the American House.

CHARLES DESARMO is making arrangements to open a new plumbing establishment at Chillicothe, Ohio.

ALLIE HOOD of East Lempster bought the stock in trade of F. A. Clarke, Charleston, N. H. Mr. Hood is a practical plumber, having served a long apprenticeship to the trade and finishing in the New York school of trade. He will continue the business at Mr. Clarke's old stand in the Hoyt Building.

IN TRENTON, N. J., last week, Chancellor McGill dismissed a suit brought by local pottery firms to break the Sanitary Pottery Trust, known as the Trenton Potteries Company.

The Chicago Master Plumbers.

The Chicago Master Plumbers held their regular meeting at 197 East Madison street Monday evening, May 28. The following officers and members of the association were elected delegates to attend the convention of the Illinois Master Plumbers' Association, to be held at Peoria Thursday, June 7:

Paul Redieske, president.
Thos. Conway, vice-president.
Alex. W. Murray, financial and recording secretary.
P. Sanders, treasurer.
G. A. Larson, sergeant-at-arms.
T. P. Culloton, P. M. Murphy, C. C. Breyer, J. R. Breen, D. M. Quay, M. J. Carboy, } Members of Executive Committee.

The Apprenticeship Question.

The following extracts are taken from an interesting paper prepared by Jos. Shearlock of New Haven for the Connecticut State Association of Master Plumbers for their convention held at Hartford, Conn., February 15:

I have chosen three general heads under which to discuss this matter—viz.: 1. Is an apprenticeship system necessary? 2. Apprenticeship from the standpoint of the master plumber and the boy. 3. Will the end justify the means? To the first question, Is an apprenticeship necessary? I answer yes, and will give my reasons therefor. Labor saving machinery has not played a very important part in the plumbing trade, except in the manufacture of traps and some other minor detail. The hand work of the craft is now as it was 30 years ago, but the skillful plumber of to day must think as well as work, for the work done years ago, good as some of it undoubtedly was, must now be duplicated in all that is good and done with a clear understanding of sanitary methods that have come into existence within the last 15 years. That better work is being done now than ever before is due largely to the writing of plumbing specifications by experts in sanitary work, the requirements of which would be a revelation to some of the old time plumbers who have long since passed to their reward.

The plumber of to-day must be able to do more and must know more than is absolutely necessary in doing an ordinary day's work; he must know something about the general principles of hydraulics, the physics of gases, the circulation of water by the application of heat, &c., and must be prepared to answer offhand any question that a prospective customer or an inquisitive questioner may present.

In the midst of all these changes how fares it with the journeymen plumber—has he kept pace with the march of improvement or has he fallen behind in the race? First class work requires the services of first class workmen in its erection, but how many men have you in your employ that can be used on the best work, and how did these men attain the skill that enables them to do better work than the majority of our employees? The journeyman plumber who has the ability to erect first class work in a neat, substantial and satisfactory manner is nine times out of ten well along in the thirties and one who has been in constant practice from his nineteenth or twentieth year up to date. From this I draw the conclusion that constant practice and some study are absolutely necessary to the development of the really first-class workman. It is true that many of the best have reached perfection in the art without the aid of apprenticeship indentures, but what we want is more men who are able to do the best work, and this I think we can obtain only through the systematic and thorough methods that can be enforced by a well regulated apprenticeship system. Is it not true that fully 90 per cent. of all the journeymen plumbers have learned what they know about their every day work as follows?

A boy has reached the age of 18 years, when it becomes necessary that he must support himself and acquire the ability to earn his own living. His father or perhaps his mother has an idea that plumbing is a good trade for the boy to learn. If he finds a master plumber in need of more help a bargain will be struck and the boy set at work. All this is done with a present purpose only, and no ultimate result is aimed at. The boy will continue to work along until the master plumber has no further immediate use for him, and when that time arrives he is dropped to seek work elsewhere. By this time he is 20 years old perhaps, and still without the rudiments of his trade. He has a smattering, however, of the way work is ordinarily done, though he has obtained but little knowledge of how it ought to be done. He secures employment with another master plumber, to be again dropped when convenient for the employer to do so. By this time he is 21, has attained his majority, and if he has anything in him will see plainly that something must be done. He puts on a bold front and asks for work as a journeyman, well knowing that his ability will not warrant his employment as such, but being equally sure that in no other way can he obtain that practice he knows is essential to enable him to do good work. You all know how long he will work for you as a journeyman. Perhaps long enough to permanently injure your reputation for doing first-class work, perhaps not so long, but the result is the same, another discharge, followed by another and still

another attempt by the young man, until he has obtained that practice which will enable him to take his place among the rank and file of ordinary journeymen. . . .

If we are to take an apprentice let him be 16 years old. The first year of life in the shop will be largely taken up in learning the names of the tools, running errands, &c.; his time being worth but little we can pay him but little. The second year he will be well acquainted with details and ought to make a good helper; he is therefore worth more and you can therefore pay him higher wages. During the third year you will or should expect him to handle the tools himself, and toward the end of it he should be expected to do simple jobs under the eye of the employer or journeymen. The fourth year he should be in actual work on the building; he will make mistakes—we do—but he must be encouraged to learn in every way that is possible, and by the end of the fourth year should be able to do rough work, gas fitting, &c., in a satisfactory manner. The fifth and last year he should take part in the best work; it is almost certain that he will not have the necessary ability to do such work, but he should be encouraged to do his best. During the last three years he should receive wages in proportion to his ability. I would not recommend any arbitrary rate of wages. Pay every boy as you would every man —what he is worth.

The second thought—viz., apprenticeship from the standpoint of master and boy. Speaking to the master first, I would suggest that if you have any idea of taking an apprentice, ask and answer the following question: Do I want an apprentice or do I want a boy? Here is a distinction with a difference. To take an apprentice means there will be with you for five years a youth fast growing into manhood. During that five years his future will be to a great extent molded for good or evil. You are to see to it that he has opportunities to learn that which shall be in the future his sole means of support. Are you willing to take upon yourself this responsibility? If you are, let me advise you. Do you know anything about the boy. If not, find out something. Who are his parents? Are they willing to do what they can to encourage him to learn a trade and to co operate with you in your endeavor to make him a good workman and citizen? Now look the boy over as carefully as you would if you were about to hire a journeyman, or more carefully. Your experience with workmen will tell you if he has got the general make up necessary for the development of a good workman. If you are not perfectly satisfied in every way do not take him, but don't make him a drudge. Treat him as one with whom you have made an important contract, and carry out your part of it, no matter what the consequence may be.

Erastus Stebbins.

Erastus Stebbins, a well-known inventor of Chicopee, Mass., died suddenly on May 22. Mr. Stebbins was born in Winchester, N. H., in 1817 and went to Cabotville when about 25 years old. He began work in 1838 with the Ames Mfg. Company, Springfield, as a machinist, and then opened a small shop of his own just back of the factory, where he began the manufacture of faucets, water and molasses gates, &c. During the war his business was carried on where the Ames Sword Company's factory stands, and later it was moved to Taylor street, Springfield, until it was sold out about five years ago. It is now a prosperous institution at Brightwood. Since his retirement from business he devoted himself to the care of his large real estate interests. Mr. Stebbins was prominent in town affairs, having been a Selectman in 1871 and a representative in the Legislature twice. He was also an organizer and director of the First National Bank of Chicopee and had been a trustee of the savings bank for several years. He was an original charter member of the St. John's Lodge of Odd Fellows when it began in 1847 and had been connected with the body ever since. He was also a prominent member of the Chicopee Lodge of Masons. Mr. Stebbins married Elizabeth A. Dudley 50 years ago and besides the widow leaves four sons.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

JOHN P. SCHAFFER, 18 Wood street, Pittsburgh, Pa., manufacturer of Novelty ventilated wall pipe and specialist in hot air, hot water and steam heating, has recently completed a hot water plant for the new residence of J. L. Scott, Edwin street, Pittsburgh, Pa., and has about completed a similar plant for three large flats just erected by Fuhrer & Sons, on Butler street, in that city. Mr. Schaffer has also received the contract for the heating and ventilating of the new public school building at Avalon, Pa., which will require some 40 radiators, and has the contract for the hot water heating for the new residence of James Booth, on Boquet street, East End, Pittsburgh, which will require some 20 radiators. In all of the above work the Novelty hot water circulator has been used. In the heating of residences and buildings with hot air Mr. Schaffer has just completed the installation of plants in the residences of John Fite, Fred. Sauer and Henry Avermann, all in the East End, Pittsburgh, and also in the new building of Leak & Green, Shields Station, P., F. W. & C. Ry. He has also received contracts for heating with hot air the new public school building in the Fourteenth Ward, Allegheny, Pa., and the residences of A. W. Vanata, Greenfield, Pa.; Geo. Schaffer, East End, Pittsburgh; S. C. Beeson, McKees Rocks, Pa., and A. J. Demmler, at Demmler, Pa. In all of the above work the Novelty ventilated wall pipe is being used exclusively. Mr. Schaffer reports considerable new work in prospect, which naturally makes the outlook for the future very encouraging.

SEALED PROPOSALS will be received by the Board of Trustees for the Improvement of the Court House, at their office in Canton, Ohio, until Tuesday, June 5, for the sewerage, plumbing and gas fitting of the entire court house.

SHACKELFORD & GENTRY of Richmond, Ky., have been awarded the contract for heating the new school building about to be erected in that city, the price obtained being $1200. They will use the Triumph King furnace, manufactured by the Craig-Reynolds Foundry Company of Dayton, Ohio.

GODLEY & MORRIS have the contract for an extensive job of plumbing for August Straus, at his residence on Forest street, Oberlin, Ill.

THE BOARD OF EDUCATION of Newark, N. J., have awarded the plumbing and repairing contract for the coming year to the Edward Dunn Company.

AMONG the contracts recently taken for steam heating by Kehm & Mertz, 289 Kinzie street, Chicago, can be mentioned the following: Women's Memorial Chapel, Penn and Veddar streets; 16-room school building, Washburne avenue and Robey street; residence of J. T. Quinn, Oakdale and Lake View avenues.

DAVID HORN of York, Pa., has secured a contract for warming and ventilating a 12-room school building in that town, and will use four Economy combination steam and air heaters. The plant is to be installed after plans prepared by the J. F. Pease Furnace Company.

THE MORGAN STEAM HEATING COMPANY of Cleveland, Ohio, have the contract for heating the new residence and office of Dr. Hobson on Prospect street with a hot water plant, and will use a battery of two Economy hot water heaters, No. 118.

SEALED BIDS will be received by F. P. Dixon, chairman of the Board of Education at St. Charles, Minn., until June 11, to furnish with heating apparatus the annex to the present school house.

COOK & CHICK, 253 and 255 Kinzie street, Chicago, are to overhaul the steam fitting in the flat building of L. D. Hammond, Ellis avenue and Forty-third street. They will also install a hot water heating plant in the residence of Edward Lister, 23 Greenwood avenue.

SULLIVAN & HAYNES, Jefferson, N. Y., have been awarded the contract to place the new heaters in the County House. Their bid was $1166.50.

THE CONTRACT for plumbing and steam heating the new court house building at Snow Hill, Md., has been awarded to Harry A. Miller of Wilmington, Del.

THE BRIDGEPORT STEAM HEATING COMPANY, Bridgeport, Conn., have secured the contract for placing a steam heating apparatus in the new office building of the Bridgeport Copper Company.

THE THEO. JACOBS COMPANY, 72 and 74 Market street, Chicago, have the contract for hot water heating in the residence of H. R. Wilson, 4332 Grand Boulevard.

PHILIP F. CONROY, Newport, R. I., has been awarded the contract for heating the new Industrial School in that city. His bid was $1487.

WM. H. LINCOLN, chairman of Selectmen, Brookline, Mass., will receive bids till June 11 for the heating and for the plumbing of the new High School building at Brookline.

SEALED BIDS will be received by J. J. McIntire, Osceola, Iowa, up to June 5, for the construction and erection of steam heating apparatus in the two story High School building about to be erected in the independent school district of Osceola, Clarke County, Iowa.

E. BAGGOT, 169 and 171 Adams street, Chicago, has the contract for plumbing and gas fitting in the residence of J. W. Stevens, Grand Boulevard, near Forty-second street.

. The Klatte method of rolling weldless chain has been introduced at the Germania Works, Neuwied, Germany.

ROOFING AND CORNICE.

Hayes C. E. Metallic Lathing.

George Hayes, 71 Eighth avenue, New York City, whose inventions in connection with architectural engineering are well known, has just brought out a new invention in metallic lathing, to be known as the Hayes C. E. (corrugated expanded) lathing, of which an illustration showing front view is presented herewith. This lathing has been patented in the United States and foreign countries.

Front View of the Hayes C. E Metallic Lathing.

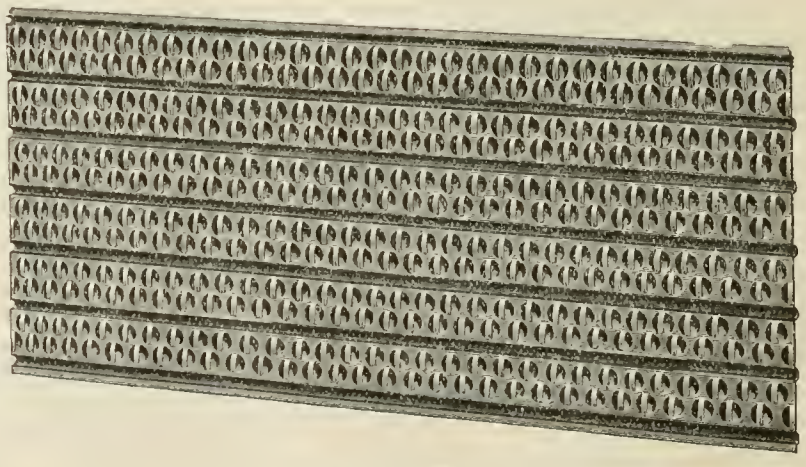
The system is described as follows: He takes a sheet metal blank, say 30 x 96 inches, corrugates the same and otherwise forces it out of plane, after making, at prescribed intervals over its entire surface, certain slits or openings which, in the process of manufacture, are expanded, the outlines thereof being double arc lines, one on each side of the chord, forming lanceolated openings, their axes representing the true length of the metal employed. These apertures are arranged longitudinally, occurring in the depressions, while upon the elevations are formed a series of arched loops having a concave crown. The depressions and elevations form the corrugated surface, while the loops give the appearance of transverse corrugations. Strange as it may appear, and in seeming conflict with the inflexible law of geometery, this divergence from the plane of the sheet and from the axis of the openings does not, it is claimed, detract from the original flat sheet, either in its length, width or thickness, producing a sheet of finished lathing 30 x 96 inches. Moreover, it is pointed out that a sheet of metal lathing so corrugated partakes of all the strength and rigidity of an ordinary corrugated sheet, and when reinforced with plastic material becomes as substantial as a slab of stone. Among the advantages claimed for this lathing are that it is easily handled and applied; that there are no cutting edges or points to injure the hands; that it is readily cut to any size with an ordinary pair of tinsmiths' shears and can be readily bent into any form. It possesses a most perfect clinch or bond for the mortar, can be plastered on both sides and does not permit a free escape or waste of mortar.

The use of this material for inexpensive fire proof construction is alluded to, and it is pointed out that any timber constructed building may be rendered practically imcombustible by its use, conjoined with that of plaster. It is recommended particularly for the inclosing of elevator and dumb waiter shafts, and for partitions, where a double plastered face is made from 1 to 2 inches in thickness, thus effecting a material saving in floor space.

The Indiana Paint & Roofing Company, 42 West Broadway, New York, make a specialty of sheathing papers and silica paints for roofing. They are issuing at the present time an attractive little four page booklet, "To Men of Real Estate," that is well calculated to direct the attention of all who have anything to do with roofs or roofing to their roofing materials.

The Kansas City Metal Lath.

The Kansas City Metal Roofing & Corrugating Company, Kansas City, Mo., are placing on the market the Kansas City metal lath, which is claimed to be exceptionally stiff. The lath is made of No. 29 United States gauge sheet steel in sheets 27 x 48 inches. It has half round ribs or corrugations 3¼ inches apart, which run the full length of the sheet, thereby securing great strength and stiffness. Between these ribs slots are arranged with depressed lips, forming an incline upon which the mortar easily slides through to the back, where it forms a perfect lock or clinch around the strap between the depressed lips, thus avoiding any waste of plaster, and at the same time, it is said, the plaster will adhere firmly to the surface of the lath. The Kansas City Metal Roofing & Corrugating Company report



The Kansas City Metal Lath.

a good demand for this lath, and state that the architects and builders who have used it speak very highly of its merits.

FLASHINGS.

THE CINCINNATI STAMPING COMPANY, Cincinnati, Ohio, issue a special circular relating to the Reagan metallic shingles which they manufacture. It is a pamphlet of convenient size, shows separate views of the different patterns of the shingles, including the Alexis and Gothic; also general views of roofs with the shingles applied. Other illustrations show valleys, gutters and ridging. Full descriptions accompany the cuts and a price-list is given of the goods. Three pages at the close are devoted to signed and dated testimonial letters which speak in high terms of the Reagan shingle.

THE NEW EDITION of the illustrated catalogue of Vaile & Young, Baltimore, Md., is an exceptionally neat and pleasing publication. It is a small volume bound simply in blue card covers, carrying the name of the firm and reference to their patent metallic skylights without putty and a cross section of skylight bar as a front page. A dozen pages are devoted to a careful and accurate description of their well-known skylight, the description being made plain by the aid of illustrations. Smaller cuts are also shown of hipped and turret skylights, &c. The remainder of the pamphlet contains half-tone engravings showing a large number of buildings where these skylights are in use. One of the folder pages shows a general view of the Marine Department of the Maryland Steel Company, on whose buildings Messrs. Vaile & Young have erected over 60,000 square feet of skylights. A handsome picture is presented of the new Library Building of Congress calling for 14,000 feet of skylight construction in copper. Other prominent buildings are included in the illustrations.

THE KANSAS CITY METAL ROOFING & CORRUGATING COMPANY, Kansas City, Mo., have just completed the decoration of their president's office in the Builders and Traders' Exchange. The decoration consists of an artistic and elaborately designed ceiling and side walls of stamped steel, made by the Wheeling Corrugating Company, for whom the Kansas City Metal Roofing & Corrugating Company are general Western agents. On May 22 an informal reception was held, to which the architects and builders of Kansas City were invited and expressed themselves in complimentary terms regarding the interior decoration above referred to.

THE FOSTORIA STEEL ROOFING COMPANY of Fostoria, Ohio, have just issued their sixth catalogue. This is a handsome publication of 68 pages, bound in stiff paper covers, with an embossed gilt title. The contents begin with an illustration of tubular seam steel roofing, together with a full description of the manner in which it is laid. Then follows pressed standing seam roofing, for laying which full directions are also given. After this comes V crimp roofing. This is succeded by sheet metal weather boarding, beaded siding and ceiling, pressed corrugated iron and steel, corrugated iron elevator siding, climney flashings, sheet steel pressed brick, rock face brick siding, sheet steel imitation stone panel, window and door casings, corner boards, corner caps, ridge rolls, &c. A valuable feature in connection with sheet metal specialties is the practical nature of the directions for applying them. Rules of measurement are given, as well as tables showing approximate weights of different kinds of roofing and siding. A separate department of the catalogue is devoted to eave troughs, miters, box gutters, corrugated conductor pipes, corrugated elbows, plain lock seam pipe, spiral pipe, hangers, finials, &c.

THE MONTROSS METAL SHINGLE COMPANY of Camden, N. J., have just issued a 20-page catalogue of their goods. In an announcement on the opening page the company state that they are alive to the fact that every order they fill is an advertisement either for or against them, and that as the manufacture of their line of goods constitutes their sole business, they cannot afford either to use inferior material or to slight the workmanship. The Gothic tile, Diamond tile, metal slate or shingle, Eastlake, Octagon shingle and special valley, made by this company, are all described and illustrated, and there are also illustrations of buildings covered with the tiles and shingles.

THE KANNEBERG ROOFING COMPANY, Canton, Ohio, have recently placed in their factory three new machines of their own invention for manufacturing corrugated galvanized conductor pipe. They claim this greatly improved machinery enables them to make the pipe in 10-foot lengths, with the corrugations deep, round and of uniform size.

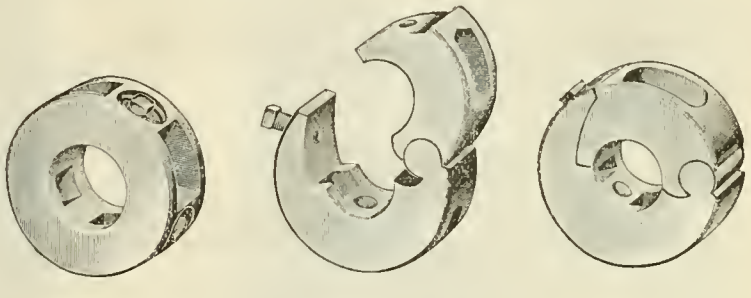
GOOD & WATERMAN, Laclede Building, St. Louis, have been appointed agents for St. Louis and vicinity for the sale of Walter's shingle, made by the National Sheet Metal Roofing Company, Jersey City, N. J. They report an excellent demand for these shingles and are now sending sample shingles and catalogues to the trade.

KNORR & BLOCKS, 165 Wells street, Chicago, are to supply the galvanized iron bays and cornices for the store and hall building of J. Geitner, Arlington Heights.

Newport News, Va., the youngest exporting port of the United States, is rapidly advancing to the front rank in importance. Its exports and imports during the past times of dullness and depression are said to have held up phenomenally, thanks to the institution of the Chesapeake & Ohio direct steamship line to Europe, which makes the port its headquarters. The Chesapeake & Ohio Railroad Company have millions of dollars invested in the place, and it is stated that President Ingalls of that road is about to sail for Europe to engage more steamships for the line.

The Giant Safety Collars.

These collars, which are shown in both the solid and split forms in the accompanying engravings, are chambered so as to avoid unnecessary weight upon the shaft, but this is done in such a way as to preserve full bearing surfaces at each end. The split collars have a hinge joint and may be put upon the shaft in a space equal to their length. When in place, the set screw that holds the collar together also secures it in position on the shaft. No bolts are used, and the set screw heads do not project above the surface. These collars, which are made by the Gouverneur Machine Company of Gouverneur, N. Y., have all the strength required, and all useless weight is avoided.



Solid. *Split, Open.* *Split, Closed.*

THE GIANT SAFETY COLLARS

SCRAP.

J. IRVING ROOERS, 53 Newcombe street, Liverpool, is sole agent for the United States and representative for the home trade for Cook Jenkins' tin house bran. He issues a circular price-list, giving the cost per net ton of the different qualities of meal and bran.

MARSHALL BROS. & Co. of Philadelphia have been compelled to shut down their rolling mills and tin plate works for want of fuel.

N. & G. TAYLOR COMPANY issue notice that for the benefit of the trade in Syracuse, N. Y., and vicinity, they will carry a full line of their guaranteed and special brands of roofing tin at 339 West Fayette street, Syracuse, N. Y. They request that all orders be addressed to N. & G. Taylor Company, Syracuse, N. Y.

The coal supply on the Duluth docks, Duluth, Minn., is reported as shrinking rapidly. Should the present rate of shipment continue the supply cannot last for more than two or three weeks longer.

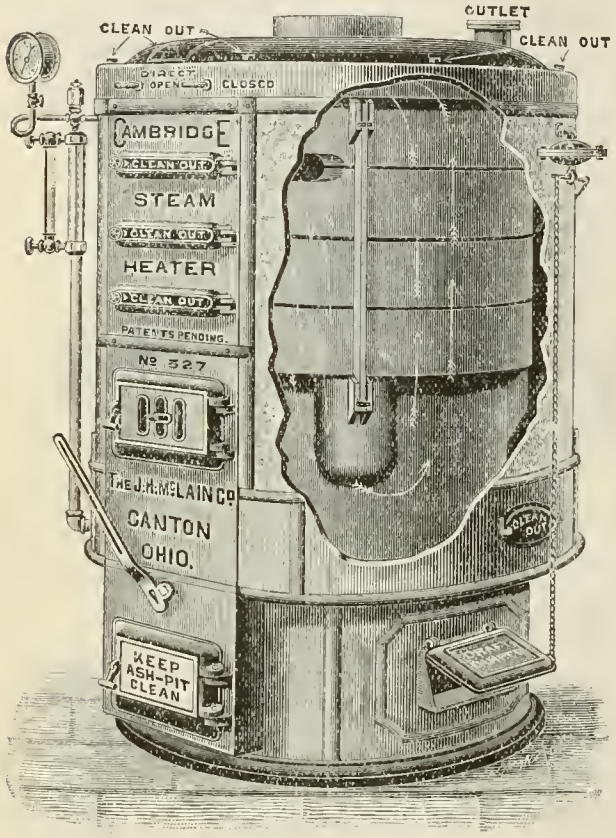
The Panama Railroad Company, since their disagreement with the Pacific Mail Steamship Company, have made arrangements for operating their own steamer service to Colon. For this purpose three vessels of the defunct Brazil Steamship Company, and now owned by the Standard Oil Company, have been chartered and are being fitted out in the Erie Basin.

STEAM AND HOT WATER.

The Cambridge Steam Heater.

The J. H. McLain Company of Canton, Ohio, have just brought out a new steam heater, christened Cambridge, which is herewith illustrated in Fig. 1.

The heater is built up of sections, Fig. 3, on the top of which is placed a smoke dome with an extension to receive the jacket. The sections are divided into tubes running from the front to the rear of the heater, these tubes being shaped and placed as shown in the sectional cut, Fig. 2. By this arrangement the manufacturers claim that the flames envelop each and every tube impinging against the bottom of the steam dome, thus preventing any deposit on the heating surface. The section next to the steam dome is used as a superheating chamber, and it is claimed that the steam entering the pipes will show a much higher temperature than is indicated by the pressure gauge. By closing the draft dampers the heated gases are directed down between the front of the heater, and then passing around the channel irons sweep over the entire surface of the heater before reaching the outlet in smoke dome. The Chicago agents for this company are the Illinois Heating Company, 88 Lake street.



The Cambridge Steam Heater.—Fig. 1.—General View with Casing Broken Away.

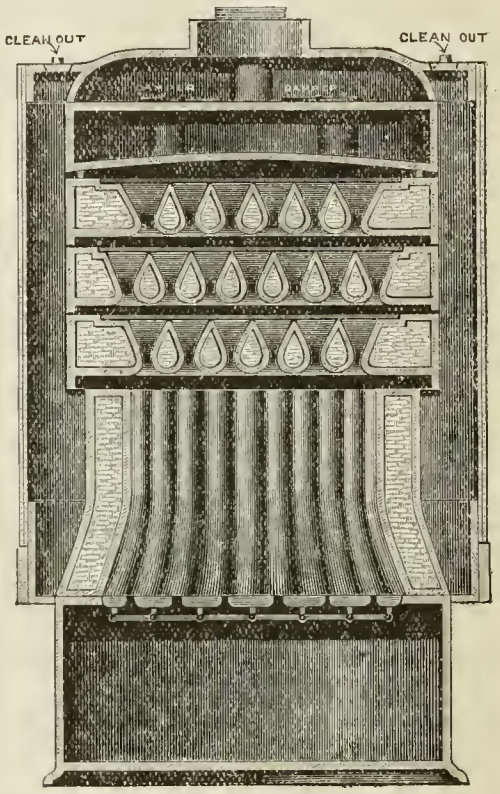


Fig. 2.—Sectional View of Heater.

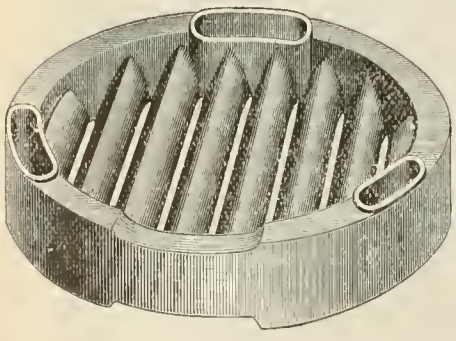


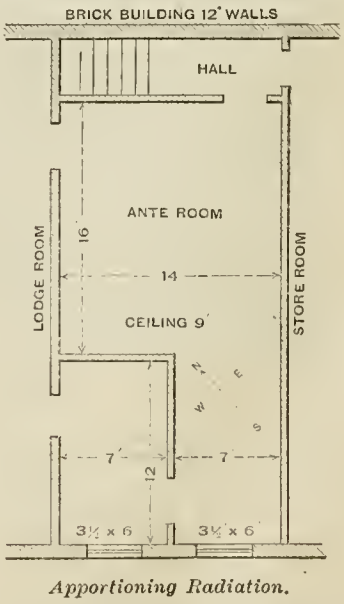
Fig. 3.—General View of Section.

THE HERENDEEN MFG. COMPANY, Geneva, N. Y., send out postal cards printed in red and green ink directing attention to their book on home warming and ventilation, which they distribute on application. Incidentally the postal refers to the merits of the Furman boilers.

A NEW COMPANY have been formed under the name of the Royal Steam Heater Company, Gardner, Mass., and have purchased from the Central Oilgas Stove Company the patterns, &c., of the Royal Heater, which they will manufacture and sell. They will also erect steam and hot water heating apparatus. A new factory is being built, to be occupied by the company by July 1. The officers are J. R. Davis, president; C. O. Burt, vice-president; E. O. Drake, treasurer.

Apportioning Radiation.

From L. A. H., *New York.*—I inclose a sketch of two rooms on the third story of a brick building located in Westchester County, N. Y., which are used as anterooms to a lodge room. They have about the same amount of exposed wall and glass surface, although in their cubical contents there is considerable difference. I wish some of



Apportioning Radiation.

the readers of *The Metal Worker* would enlighten me as to the proper amount of radiation to heat these rooms by steam to a temperature of 70°. I would like to have the rule for figuring the radiation, and what difference should be made if the room faced north instead of south.

HEATING NOTES.

J. H. WALLACE, Pine Bush, N. Y., installed a Royal steam heater in the Reformed Church at Montgomery, N. Y., which a recent issue of the church paper praises highly.

THE WALWORTH MFG. COMPANY of Boston, Mass., have engaged a suit of rooms at the Broadway Central Hotel for use in displaying their various pipe fitting tools and steam and hot water heating goods and appliances during the steam fitters' convention in June. Their New York office is at 56 Beekman street, where a variety of their goods are shown.

SMITH & ABBOT COMPANY have been organized at Portland, Maine, for the purpose of making and selling steam and other heating apparatus and lighting and electric fittings.

THE J. H. MCLAIN COMPANY, Canton, Ohio, will have a full line of their Canton heaters on exhibition at the coming convention of the Master Steam and Hot Water Fitters' Association of the United States, which is to be held on June 19, 20 and 21 at the Broadway Central Hotel, New York City. The company will be well represented and hope to meet all their friends on the occasion. Their New York office at 69 Centre street is now fully equipped with sample heaters in charge of D. R. McCallum, who will attend to the wants of the trade in the heating line.

THE RICHMOND STOVE COMPANY, Norwich, Conn., distribute to their agents special illustrated catalogues relating to the Richmond heaters for steam and hot water. One circular, larger than the usual size, is issued to the Pond & Hasey Company, Minneapolis, Minn. In addition to the usual descriptions and illustrations of their goods, at the end are a number of halftone engravings showing residences in Minneapolis heated by their apparatus. A second circular carries the name of G. W. Dodson, Lawrence, Mass.

C. M. CONVERSE has opened an office at 96 Lake street, Chicago, representing the Elwood Iron Works, manufacturers of radiators, at Elwood, Ind.

THE STOCKHOLDERS of the Sperl Heating Company held a meeting last week and elected the following Board of Directors: E. E. Hendrick, A. P. Trautwein, C. E. Rettew, Edward Clarkson, E. W. Jackson, A. D. Harding and Thomas McDonald.

THE J. H. MCLAIN COMPANY, Canton, Ohio, have just opened an office at 1528 Champa street, Denver, Col., with G. B. Laramie, recently assistant manager of the American Boiler Company, Denver, in charge. They will carry a full line of Canton heaters for hot water, steam and warm air.

THE SMITH & ANTHONY COMPANY, Boston, Mass., through their New York house at 56 Beekman street, have engaged space at the Broadway Central Hotel for the exhibition of their hot water and steam heating goods during the convention of the master steam fitters. They will also have a room where they will receive and entertain their guests. The showrooms on Beekman street have been specially arranged with a view to presenting many attractions to the visitors to the convention, the Sanitas specialties occupying the position of honor.

AT A RECENT MEETING of the stockholders of the Gurney Hot Water Heater Company of Boston, Mass., it was unanimously voted that the name of the company be changed to the Gurney Heater Mfg. Company instead of as heretofore the Gurney Hot Water Heater Company. The company therefore will on and after June 1 be known under the title of the Gurney Heater Mfg. Company. The officers of the company are Edward Gurney, president; John A. Fish, vice-president; John M. Paisley, treasurer, and William T. Isaac, secretary. The company state that as they have added to their list of manufactures steam boilers and steam radiation, and inasmuch as the former designation of the company had limited their apparent operations to water heating apparatus, they decided to change their name slightly as above in order to specify without radical alteration more fully and broadly the field of their future operations.

WE ARE IN RECEIPT of an interesting batch of advertising matter from the Herendeen Mfg. Company, Geneva, N. Y. One of the pamphlets, entitled "Home Warming and Ventilation," is the third edition of this little work that the firm have published. The volume comprises extracts and articles by many well known authorities. Another pamphlet is the special florists' edition of the catalogue and shows the Furman heater in various styles and likewise presents illustrations showing the heater adapted to greenhouse work. Another pamphlet, very prettily gotten up, is entitled "The Faultless Furman Hot Water and Steam Boilers," being the regular catalogue with illustrations, description, price lists and references. Accompanying the pamphlet is a circular relating particularly to the Furman Junior hot water boiler, which is a small heater with a grate 12 to 14 inches in diameter and standing from 35 to 48 inches high. It is adapted particularly for conservatories, small dwellings, bathtub heaters, laundries, barber shops, &c.

The American House Beautiful.

In referring to the homes of American business men and contrasting them with the stately and the cottage homes of his own land, a writer in a late issue of *All the Year Round* presents the following views, which may prove interesting to many of our readers:

We Englishmen are proud, and justly so, of the stately and the cottage homes of our land. There is nothing like them elsewhere in the world, for they possess peculiar features of their own—the former in their antiquity and their associations, the latter in their own beauty and that of their surroundings. But the great mass of us live neither in stately homes nor in cottages, and of our residences—externally, at any rate—we have very small reason to be proud. Now, as the Americans have no stately homes of our English type, with the exception of the fine old colonial residences of Virginia and New England—and as their cottage homes are modern, practical and consequently ugly, and, as we have said, there is a wealth of refinement in many American minds, they have succeeded in making the villa residences of their big city suburbs the most beautiful in the world. I call them "villa residences," despite the fact that many of them are mansions in size and feature, because they are the homes of business men. The town residences of American business men are beautiful internally, but being in streets and rows they necessarily lack the external features which induce us to select the suburban home as a type of the American House Beautiful.

ORIGINALITY IN DESIGN.

In a survey of these the first fact which strikes the eye of the stranger is the extraordinary fertility of the American architectural brain in original design. A family likeness pervades all London suburban houses, be they north or south of the Thames. If there be one pretty house, there will be scores exactly like it all around: but until within the past very few years the London suburban builder reared as fast, as cheaply, and, in consequence, as inartistically as he could, with the result that the very great majority of London suburban houses are absolutely hideous. But in an American suburb, let us say for example, Brookline, near Boston, a suburb extending over miles of hill and dale, and planted thickly with houses, it may be asserted that not half a dozen buildings are exactly alike. The straining after the original and the striking has, of course, resulted in the erection of a few monstrosities, and of some houses more eccentric than pleasing in design, but the general average is exceedingly high. In this general originality of house design I seem to see a far greater instance of the much vaunted American liberty and independence than in any of the political and social institutions of the country.

INTERIORS.

After we have surveyed the exteriors of the houses and proceed to their interiors another new fact strikes us, and this is how very much better the different classes of American business men are housed than are their corresponding grades in our own country. Shop walkers, counter men and good artisans go home every evening to houses which in England would not be deemed unworthy of city men of good position. The taste in furnishing and decoration may not always be as good as the houses themselves, but there is nothing corresponding to what may be called our London "genteel villa residence," and the bank clerk, instead of huddling in one yellow brick box in a long row with a big name shuts himself up for the evening in his own little detached castle, which contains on a small scale all the accommodation and many more of the conveniences of an English gentleman's house. As we rise higher in the scale we reach the American House Beautiful, as distinguished from the American House Magnificent.

The recent rainfall was the heaviest ever recorded in Pennsylvania during the month of May. In five days of last week more rain fell in Philadelphia than during the whole month of any previous year since 1852. The damage caused by floods in the Susquehanna and Schuylkill valleys reached several millions of dollars. Happily the loss of life was comparatively small.

The war on immigrant rates from the Eastern seaboard to points west of Chicago and St. Louis is at last ended by agreement between the Western railroads.

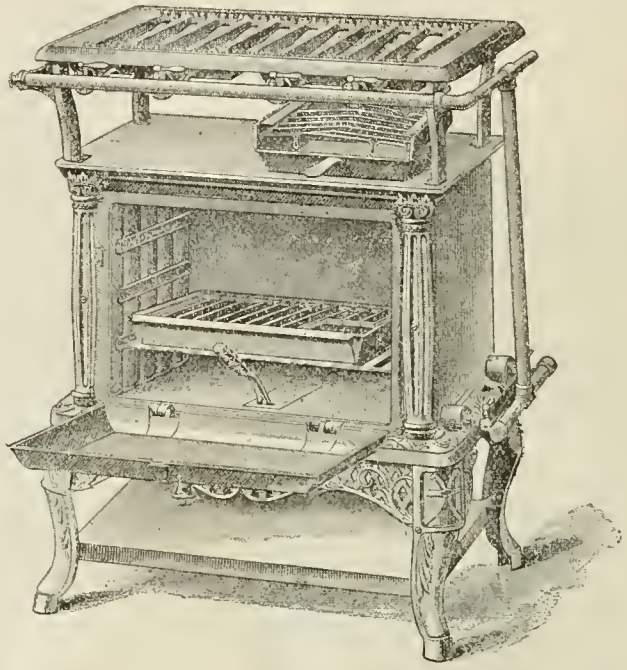
A Novel Stove Ornament.

The illustration shows a piece of the handiwork of John J. Fones, a native of Pawtucket, R. I., and now foreman of the sheet iron shop of the Richardson & Morgan Company, 92 Beekman street, New York. Mr. Fones, who is over 60 years of age, speaks of the first 19 years of his practice as sheet iron butchery of the "trim and fit" character. He says *The Metal Worker* first inspired him to work on a different line, and as a result he left his native town in order to receive the night instructions given to mechanics in New Haven by the professors of Yale College. He applied himself to the study of geometry and acquired the art of pattern cutting to the absolute disuse of all "trim and fit" methods. The ornament shown in the illustration is supported by a brass tube attached to the top of a stove, and consists of a hub with arms connecting with circular hollow tubes forming the frame of the revolving ornament. Holes drilled in these tubes support wire shafts which fit into glass bearings in air wheels resting upon them. The upper portion is made to revolve by the pressure of the air heated by the stove rising against a cardboard spiral fastened to and suspended from the hub by wires. There are 45 air wheels of various sizes, but all of different shape, some revolving in one direction and some in the reverse direction. Some of the wheels are in one piece, others have as many as 24 pieces, and the patterns for all were developed by the same rules that daily apply in pattern cutting. The wheels are covered with colored enameled papers, tinsel rosettes and artificial flowers, which give it a very gay appearance, and when in motion it is quite a fascinating sight. This ornament is only one of several that have been made for different parties, no two of which have been exactly alike.

A Novel Stove Ornament.

The Wolff Gas Cookers.

The illustrations presented herewith show the Wolff gas cookers manufactured by the Wolff Gas Radiator Mfg. Company, 164 Franklin street, New York. Fig. 1 shows the Wolff gas range, which is possessed of many attractive features. In appearance it is substantial without being cumbersome. The top is rather novel in construction, consisting of an outer frame with a series of removable bars resting just above the burners on which boilers or kettles may be placed. The burners located just below these bars are covered with an irregularly perforated cast iron plate having projecting pins on the lower side through which the flame plays. In operation this plate and the pins become red hot, throwing a strong radiant heat against the vessels for cooking food in addition to the heat of the gases which play around them. As is shown in the picture, these burners are raised slightly above the top of the oven, so that steaks or articles to be broiled can be placed on top of the oven under the burner. The construction and arrangement of the oven is such as to get the full effect of the gas consumed. The burner is made in two parts at the front and back of the oven and may be lighted by lifting out the plate in the bottom of the oven, which is shown with a litter in it. The flames of the two parts extend all across the oven, thoroughly heating it, and the products of combustion pass up the sides of the oven through circular tubes which heat the oven on the sides. These tubes being within the casing of the oven proper, the outer sides of the oven are but little heated and but a small heat is thrown off into the apartment in which the stove is used. These tubes enter a chamber at the top of the oven by means of a flue, the heat being distributed over the top of the oven and then passing down to an outlet at the bottom of the oven at the back. This range is made in two sizes. Fig. 2 shows the Wolff gas cooker, the burners on the top of which are the same in construction as those on the gas range, and the broiler beneath them has the advantage of a door so that roasting as well as broiling can be done. By means of a portable oven resting on top of the cooker baking can be done. The cookers are also made in two sizes.



Wolff Gas Cookers.—Fig. 1.—Gas Range.

The feature of both the ranges and cookers is their ample capacity in the oven and broiler space.

The official returns of the foreign commerce of New York for the month of April show a considerable decrease as compared with the corresponding month of last year. The total figures are: April 1894, $81,095,074; April 1893, $101,003,716; a falling off of $19,908,642. This decrease is mainly due to the loss of imports, which amounted to $17,273,203, while the movement of specie shows a decrease of nearly $3,500,000. In merchandise, exclusive of specie, the exports show a gain over last year of nearly $2,000,000. For the first four months of the calendar year the imports of merchandise reached $148,511,981, against $230,948,996 last year, and exports $116,724,460, against $100,939,451.

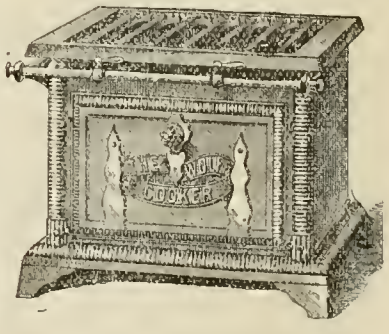


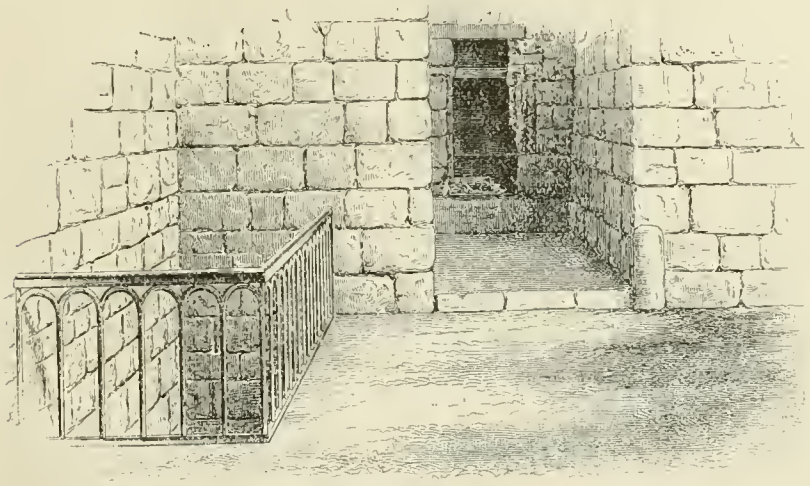
Fig. 2.—Wolff Gas Cooker.

STOVE TRADE NOTES.

A Very Old Furnace.

We have within recent years printed several descriptions of old stoves, most of them of early American manufacture. Some of them have dated back but 20 years or so, others had their origin before the Declaration of Independence, and there were one or two, if we remember rightly, that were made on the other side of the ocean a century or two ago. The illustrations have shown various degrees of crudity in design and decoration, but all have been interesting as types of manufacture at different periods, showing how the art of stove founding has progressed toward both greater utility and a higher standard of decoration.

Now we will go backward still further in the history of house warming and give an example of a much earlier type of heating apparatus than any of those we have heretofore presented; the heater in mind is in fact the progenitor of the hot air furnace and belongs to the class of apparatus that the ancient Romans used in connection with their famous public and private baths. The accompanying engraving, which was made from a photograph, shows very imperfectly a Roman bath and hypocaust as they may be seen today in the city of Chester, in England. The apparatus, if we may so term it, is beneath a little stationery shop and was unearthed some 75 years ago, but though the masonry was built very many centuries ago the workmanship was so admirable that it appears to be hardly more than 100 years old. The city of Chester was an old fortified camp of the Romans and the bathing establishment we illustrate was built during the first century. The fire pot of the heating apparatus, or hypocaust, is a low stone room, entered through the doorway shown at the back of the picture. Here the fire of wood was built and the heat transmitted through the ceiling to the room above. The bath, of stone, shaped much like a modern bathtub, though longer and very much deeper, is now surrounded by an iron railing, as shown at the left of the engraving. It is in excellent preservation and is water tight to this day. The following particulars of the apartment are from Hemingway's History of Chester: The bath is 10 feet long, 7 feet deep and 4 feet wide (date A.D 95). The hypocaust is 18 feet long, 8 feet wide, over which is the sudatorium (or sweating room), of the same dimensions. The roof of the hypocaust is of Roman tiles, 3 inches thick and 19 inches square, perforated with small holes 6 inches apart. Immediately over these tiles is a bed of finely powdered lime 9 inches thick, for the purpose of conveying the heat (and preventing the smoke) to the sudatorium above, around which are seats, on which the bathers sat until the heat from the hypocaust threw them into a free perspiration, after which they were scraped with a bronze instrument called a strigil (by which means all impurities were removed from the skin). They were then shampooed, rubbed down with towels (linteа), perfumed and anointed with oil, after which they retired to the anteroom (tepidarium), where they waited until quite cool before returning into the open air.



A Very Old Furnace.

ODD PLATES.

Many of the storage warehouse companies in the city, says a writer in a Boston, Mass., paper, have this season inaugurated a new plan in regard to taking stoves for storage during the summer, and are refusing to store them unless the fee is paid in advance or they are stored with other articles. The reason for the step is that many of the companies have had valueless stoves left on their hands by the owners, who replaced them with new ones in the fall. The stove then had to be kept for a long while, and if the owner refused to take it away it was sold for old metal at a low price, so that the total loss to the company was considerable. A few companies in the city take stoves of all kinds on storage as formerly, but even those doing so complain that the business is attended by a loss.

At a meeting of the stockholders of the Mobile Stove & Novelty Works, held on the evening of Thursday, May 17, Adam Glass, A. H. Spira, T. S. Fry, E. E. Posey, William Edgar, William Stou'z and J Thompson were elected directors.

We learn from the J. H. McLain Company, Canton, Ohio, that they have about ready for the market their new warm air furnace, called the Oxford Perfect Blast. They have already issued advance sheets of their warm air catalogue, which are ready for the trade.

A recent issue of the *Herald*, published at Quincy, Ill., is authority for the statement that Henry D. Castle has disposed of his interest in the Comstock-Castle Stove Company of that place, and will engage in business in New York City.

John Keyser, the veteran stove manufacturer, of 115 Beekman street, New York, closes his business career upon July 1 next. Mr. Keyser is hale and hearty at the age of 76 years, 55 years of which have been passed in intense business life as a manufacturer of stoves and furnaces and an inventor. Mr. Keyser was born in Westport, Conn., and began business in 1837 as a polisher of stoves at 247 Water street, New York. In two years' time he was in the position of an employer, and has remained so ever since. Altogether he has taken out 32 patents for stoves and furnaces. He has had a checkered business career, having at one time been the head of a very large enterprise, but like the majority of other men in active industrial life he has been overtaken at times by disaster. The work of his life that Mr. Keyser dwells on with pardonable gratification are the charities and reforms of one sort or another with which he has long been associated. Mr. Keyser will make his home at Hartford, Conn.

Hansell & Belson have issued a notice to the trade to the effect that they have located at 144 North Second street, Philadelphia, Pa., for the sales agency of Charles N. Noble & Co.'s full line of stoves, heaters and ranges. The firm also carry in stock a full line of steel ranges, gasoline, oil and gas stoves, refrigerators, ice chests and numerous side lines adapted to the wants of the trade.

William Resor & Co. of Cincinnati, Ohio, are making their Monitor parlor wood base heater in three sizes, adapted to take in wood 21, 23 and 25 inches in length. Strong claims are made for this heater, and those who have used it testify in flattering terms to the satisfaction which it has given.

A little boom in gasoline and oil stoves is reported from some sections of the West. The coal miners' strike has completely cut off the supply of coal in various districts, and the farmers are without fuel. They are thus forced to seek a substitute or go with uncooked food. Gasoline or oil cooking stoves fill the gap admirably at this season of the year, and very probably farmers'

wives will bless the day when they were driven to this pleasant method of cooking in warm weather.

THE SHOW WINDOW of Landon & Ketchum, at 23 West 125th street, New York, is made attractive by a display of gas ranges, hot plates, ovens and the Challenge water heater.

J. Q. A. BUTLER & SON are a new firm at 284 Pearl street, New York. Mr. Butler is well known to the stove trade of the city, and the new firm will make a specialty of supplying the trade with any make of stoves, ranges or furnaces that is required. The Beaver stoves and ranges stand first in the lines they will handle, and they will use the show room of the Danville Stove Company for a salesroom. They are New York agents for the coal and gas steel ranges made by the Mason & Davis Company. They will make a specialty of their combination range for both coal and gas.

THE EXCELSIOR MFG. COMPANY of St. Louis, Mo., have issued an illustrated circular bearing date of May 15, and calling attention to illustrations of three new heating stoves which they have added to their line. These are known respectively as the Rival, Hot Blast and Nestor. The first and last named are square stoves, and are claimed to possess greatly increased heating capacity as compared with round stoves of the same diameter. The Rival and Nestor are symmetrical in shape and first class in construction. Special care has been taken to insure efficient combustion, each stove having a circular draft regulator on top, by the proper adjustment of which, it is claimed, the fire can be kept 24 hours with soft coal. The addition of a magazine or feed cylinder allows these constructions to be used as self feeding hard coal stoves. The Hot Blast is of handsome appearance and constructed in a manner to give satisfaction in operation. An ornamental fretwork surrounds the inside structure, the space between the body of the stove and the casing serving to heat the air which finds its way in at the bottom and sides, thus making it practically a "room furnace." The company are also distributing as an advertising novelty a balanced butterfly made of cardboard, one side being printed to represent that insect. The tips of the wings are so weighted that placing the head of the butterfly on the tip of the finger it will readily balance horizontally, and blowing on it gently it will wave and indolently flutter like its living prototype. The unornamented side of the butterfly carries printed matter relating to the Charter Oak stoves and ranges.

THE FAMOUS STOVE COMPANY of Indianapolis, Ind., have issued an exceedingly attractive catalogue and price-list of the Magnet stoves and ranges, which they manufacture in great variety. The 54 pages of which the volume consists are profusely illustrated and carry brief descriptive particulars relative to the goods shown. The Model Magnet range for 1894 occupies the leading place and is offered as a novelty for this season. It is made with six boiler holes, fire box either right or left hand, and is adapted for using hard or soft coal or wood. Under the name Magnet the company offer a new line of four-hole cook stoves of neat ornamentation and embodying the latest improvements. Other goods of interest include the Imperial six hole range, made with two sizes of oven; the Tecumseh, another member of this class; the Best Friend, the Indiana, Black Cryatal, Tecumseh and Favorite cook stove; Brilliant soft coal base heater, made plain and full nickeled; the Brilliant surface burner, made direct draft and revertible flue; the Magnet Oak for 1894; the Magnet Todd, for burning wood; the Penn Franklin, for soft or hard coal or gas; the Tecumseh and the Champion Box.

A RECENT ISSUE of one of the local papers contains the following squib relative to a well-known representative of the Portsmouth Stove & Range Company of Portsmouth, Ohio: "Will Stork, with his limbs draped in lavender pants and his feet decorated with shoes which had gained their ideas in color from a New England pumpkin pie, together with other toggery suitable for a tour of the sunny South, left on the morning N. & W. train for Norfolk, Va., where he expects to take sea baths for a week or so to work the old puns out of his system. He also expects to sell stoves and other articles for the generation of artificial heat to the natives. 'Pete' expects to come back completely restored in health, but he will doubtless leave the South all 'stove up.'"

THE UNITED VAPOR & GAS STOVE COMPANY have applied for a charter of incorporation under the laws of Illinois. The location of the company is stated to be in Chicago and the capital stock is placed at $8,500.000. The incorporators are Walstein F. Douthirt, Frank O. Soderstrom and Morris P. Carroll. This is one of the periodical attempts to consolidate the several vapor stove manufactories. We mention the matter merely as an item of current news, which may ultimately develop into something important or else fade gently into oblivion. Thus far but little can be ascertained of the project, and probably nothing will be known until the plans of the projectors are consummated —which will be some time hence. Meanwhile the vapor stove trade will continue to amble forward at its usual pace and every manufacturer will pay more attention to getting orders and filling them than in devising schemes whereby he and his *confrères* may unite their forces into one huge aggregation.

FRIDAY, MAY 25, was a gala day with the Chicago house of the Detroit Stove Works. To properly celebrate the completion and occupation of their new warehouse, the company issued invitations to their numerous friends and patrons to a reception on that day. The invitations were elegantly engraved, as befitted such an occasion. The warehouse, at Twenty-ninth and La Salle streets, was thrown open to visitors from 9 a.m. to 10 p.m. Manager W. M. Shaddinger and Treasurer G. B. Gunderson, supported by a corps of courteous and untiring assistants from their force of clerks and salesmen, exerted themselves to their utmost to entertain the stream of visitors which continued to pour in until late in the evening. A luncheon was served in one of the apartments of the office, but it was not the chief attraction to the callers, who inspected every part of the warehouse and were unsparing in their praises of its admirable arrangement and location. The popularity of Manager Shaddinger was attested by the continuous reception held in his room, every one passing in to pay his respects. The manager's room was bright with flowers. Among the visitors the city stove trade was, of course, most largely represented, but there was also an excellent attendance from outside points. Inquiry was frequently made for President E. S. Barbour, and it was with regret that callers learned of his enforced absence on account of ill health.

THE MICHIGAN STOVE COMPANY have just issued a superbly printed circular entitled "The World's Greatest and Most Profitable Specialty in Oak Stoves." The subject matter treats of Syphon Oak Garlands. These are base heating stoves of the oak type. In them the flue entirely encircles the base, the ashes falling through an opening in the center into a large ash pan. The base flue is brought as near the floor as possible without burning it Access is given to the whole flue space for cleaning. The grate is a novel construction, designed to prevent the formation of clinkers while giving a good exit for refuse. The feed door is on the side, and has a tilting device by which the direct damper is opened whenever the feed door is opened, thus preventing the emission of smoke into the room. An independent hot air circulating flue is provided, through which air enters the bottom of the stove and flows out into the room after being heated. A cut is given showing the bottom of the stove removed, exposing the base flues. Another illustration presents a full view of the stove adorned with richly carved moldings in the top, door piece and base, with nickel foot rail and other trimmings and an artistic urn as a top piece. Comparative prices are given to show that a full base heating stove can be had at a very slight advance in cost over direct draft stoves of equal heating capacity in the company's Garland line.

CHAS. NOHLE & CO. of Philadelphia, Pa., will have several new styles of goods on the market this season, among them being a steel range. They are this week making a shipment comprising 200 heating stoves of assorted styles to Switzerland. The firm have some good foreign trade and make frequent shipments.

THE PENINSULAR STOVE COMPANY of Detroit, Mich., are presenting their agents with neat memorandum books of a size convenient to carry in the vest pocket. In addition to the regular ruled pages for memoranda there is given more or less information of a general character, among which may be mentioned, explanation of storm signals, rates of postage, both foreign and domestic, population of the larger cities in the United States, abbreviated parliamentary rules and usages, what to do in case of accidents and antidotes for poisons. There are also blank spaces to be filled in with the name and address of the owner of the book. together with other particulars, for the purpose of personal identification. Not the least valuable feature is found on the second and third pages of the covers, which carry calendars for 1894 and 1895. The company are also distributing to their friends an interesting assortment of handsomely illustrated cards, aggregating 43 in number. These, as may be supposed, are intended for advertising the company's goods and are calculated to serve this purpose in an admirable manner.

The commencement exercises of the Manual Training School at Camden, N. J., will be held in the Temple Theater June 10.

It has been decided not to hold the International Exhibition at Brussels until 1896.

TRADE REPORT.

The Iron Market.

The scarcity of Coal and Coke is having an increasing effect upon the production of Iron and Steel. Practically the manufacture of Pig Iron in the territory between the Alleghany Mountains and the Chicago district is suspended, and in their efforts to continue running the Steel mills have cleaned up the stock of Bessemer Pig.

The scarcity of soft Coal is beginning to tell on the mills east of the Alleghany Mountains, and together with the floods has caused considerable temporary suspension.

While thus the supply has been very materially curtailed the demand has improved very little. Buyers, except for small lots for immediate delivery, continue extremely indifferent.

Quite a little boom in prices has been worked up over the Italian demand for Old Rails which has been shrouded in so much mystery. Two vessels have been chartered, involving from 2000 to 4500 tons. Under the stimulus of inquiries holders have now worked up their ideas on prices to the point that any further business cannot be done, unless the Italian market goes up quite considerably.

Pig Iron.—The demand for Foundry Iron in the New York market is light, and in spite of the coal miners' troubles, prices remain unchanged. It is possible that some of the Eastern Pennsylvania furnaces will go from Foundry to Bessemer Pig. We quote standard brands $12.50 @ $13 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.75 @ $10.25.

Some holders of Pig Iron in the Philadelphia district claim to be getting better prices than have been quoted during the past two or three weeks, and look for still better prices in the near future. The market is referred to as badly mixed, however, and all sorts of quotations are given, especially for Foundry grades. A good deal depends on quality and a good deal on the desire to sell, and between the two a variation of 50¢ ℔ ton and upward is frequently met with. The usual quotation for No. 2 X is $11.50 @ $11.75, but sales at $11.25 are not infrequent. Buyers are very indifferent, however, and very few are disposed to contract far ahead even at the extremely low figures now ruling. Low grade Iron is wanted at $10 @ $10.25, delivered, but there is very little to be had at less than $10 50, some being held at a still higher figure. General quotations for Philadelphia or equivalent points are about as follows:

Standard No. 1 Foundry X	$12 50 @ $12.75
Standard No. 2 Foundry X	11.50 @ 11 75
No. 2 Plain	10.75 @ 11.00
No. 1 Soft	11.50 @ 11.75
No. 2 Soft	10.75 @ 11.00

Advices from Chicago indicate that local Coke Iron has been in excellent demand in that market. Prices are very firm, makers refusing to give concessions from current rates. Agents of Southern furnace companies report only a moderate business, yet they are receiving a great many inquiries, which are small but more plentiful of late. Some of the Southern companies are completely out of the market and others are out of some grades. The foundries in the Chicago district seem to be able to get enough Coke to keep in operation and less fear is experienced of a Coke famine than some two weeks ago. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @ $15.50
Local Coke Foundry, No. 1	11.25 @ 11.50
Local Coke Foundry, No. 2	10.50 @ 11.00
Local Coke Foundry, No. 3	10.00 @ 10 50
Local Scotch	11.50 @ 11.75
Ohio Strong Softeners No. 1	12.60 @ 13.50
Southern Silvery, No. 1	@
Southern Silvery, No. 2	@
Southern Coke, No. 2	10.00 @ 10.35
Southern Coke, No. 3	9.75 @ 10.00
Southern, No. 1, Soft	10.25 @ 10.50
Southern, No. 2, Soft	10.00 @ 10.25
Tennessee Charcoal, No. 1	@
Tennessee Charcoal, No. 2	@
Alabama Car Wheel	17.50 @ 18.00
Jackson County Silvery	15.00 @ 16.00

The stocks of Foundry Iron at Pittsburgh and in the Valleys are very light, and when the demand increases, as it must when the mills get in good running order again, it is not improbable that higher prices will prevail. Outside of a few unimportant transactions in Foundry there have been no sales for close delivery during the week in the Pittsburgh market. The following prices are asked for spot deliveries:

No. 1 Foundry	$11.10 @ $11.25,	cash
No. 2 Foundry	10.50 @ 10.75	"
No. 3 Foundry	9.75 @ 10.00	"

The general undertone of the Cincinnati market for Pig Iron has been strong all the week and especially has Soft Iron been wanted and sold at better prices. The sales were mainly in jobbing lots and of Foundry grades, No. 2 being most in demand, and No. 2 Soft coming full up to No. 2 regular because of its scarcity. The probable advancement of freight rates by the Northern railroads the middle of June has had a demoralizing effect on the market, but it would be difficult to buy much Iron to be shipped before that time. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke, No. 1	$10.25 @ $10.50
Southern Coke, No. 2	9.25 @ 9.50
Southern Coke, No. 3	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.00 @ 14.50
Lake Superior Coke, No. 1	12.50 @ 13.00
Lake Superior Coke, No. 2	11.50 @ 12.00
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.00 @ 13.50
Tennessee Charcoal, No. 2	12.00 @ 12 50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable	16.25 @ 16.75

The cut in Western freight rates, which was withdrawn early in the week, has had a beneficial effect on the St. Louis Pig Iron market. A number of heavy sales have been made which were made possible by the reduced rate. Prices are firm, and a continuance of the Coal strike will cause additional strength. Shipments are being delayed by the inability of consumers to secure Coal and Coke, and without these they have no immediate use for Iron. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$11.00 @ $11.25
Southern Coke, No. 2 Foundry	10.00 @ 10.25
Southern Coke, No. 3 Foundry	9.75 @ 10.00
Southern Car Wheel	17.00 @ 18.00
Lake Superior Car Wheel	16.25 @ 16.50

Metal Market.

Pig Tin.—The market appears to be somewhat firmer, although business has not increased and the demand from consumers and interior dealers has been very ordinary, while stock is accumulating in this market. Nevertheless official prices have been marked up a trifle and the jobbing rate for small lots of Straits Pig is maintained at about 21¢ ℔ lb.

Copper.—Business has been slow, and what there was of it passed at practically the same prices that have ruled for some time past. There is little change in the character of demand from home buyers. Prices are rather easy, 10½¢ ℔ lb being the outside asked for small lots of Lake Ingot from store. Casting stock on the same basis is generally quoted at about 9½¢.

Sheet Copper.—Nothing beyond a routine demand of moderate character is reported for Manufactured Copper. Consumers are taking only such limited quantities as they need for immediate use. Prices are, nevertheless, fairly maintained, although competition is as sharp as ever. Production has been considerably restricted of late, and manufacturers are looking to an improvement in prices as soon as general trade conditions are better. Stocks in dealers' and consumers' hands are unusually light.

Pig Lead —Sales have been moderate and the demand has not changed perceptibly, being influenced very little by the results of the tariff maneuvers. For small lots of American Pig, jobbers ask from 3⅞¢ to 4¢ ℔ lb. Western business is, however, understood to have increased, and a general improvement both in volume of trade and in prices is anticipated in that market.

Lead Pipe and Sheet —Dealers generally report a demand that is considerably below the average for the season. Some of the larger manufacturers, however, speak of a fairly satisfactory run of trade during the month of May, exceeding their anticipations in some respects. Probably the absolute dearth of speculative building has affected the jobbers, while the usual spring repairs and renewals, added to some substantial building operations of a legitimate character, have served to keep the larger houses busy of late. Prices are unchanged in this section.

Spelter. — There is a somewhat stronger tone to the market, not because of livelier buying in this section or vicinity, but on purchases made at primary points of stock for shipment elsewhere. As there is no surplus stock on the market an early improvement in price is more than likely. Ordinary

Western Spelter, in small lots from store, fetches about 4¼¢ ℔ lb.

Sheet Zinc.—The closing down of the Zinc works, owing to scarcity of fuel, has resulted in a sharp advance on Sheet Zinc during the week, with the likelihood of a further rise in price within a few days, as stocks are by no means excessive in any quarter. For 600 lb casks, 5¢ ℔ lb is the current quotation, smaller lots selling at 5½¢.

Antimony.—Only routine business has been done, but enough of it to keep the market quite steady. Quotations are unchanged.

Tin Plate.—Business has been somewhat uneven, but the aggregate makes a fair showing, and from all accounts compares favorably with that of the preceding week. Some good sized orders for moderate quantities of Cokes and Bright Charcoal Plates for the out of town trade sufficed, early in the week, to give a firmer tone to the market, as stocks of these Plates are by no means superabundant just now. Prices have, however, undergone little change, but it seems increasingly difficult to buy futures at prices that were commonly quoted a week ago. The prevailing and prospective scarcity of fuel, due to the Coke strike, has caused a rush of orders for domestic Plates. Home manufacturers are unable to make any forward contracts, in view of the more than probable closing down of the majority of Tin Plate works in the near future, owing to the shortage of domestic Black Plates, should the strike continue. As there has been a falling off in importations of Plates during the current year, amounting to at least 1,000,000 boxes, the stocks in hand at the present time are not at all excessive. The market on the other side is reported, too, as being firmer, and all indications point to the next movement of prices as being more likely to be upward than downward. Domestic Roofing Plates are in good demand. In the West, especially, there is a scarcity of this material, and jobbers report that they are unable to accumulate any stock, the Plates being shipped out as fast as received from the works.

A special London cable dispatch of May 30 to *The Iron Age* reports on the British Tin Plate market as follows: Transactions in Tin Plate have been smaller at the recent advance in prices, and there has been quite general tendency toward conservative policy in view of the supposed near approach of the settlement of the American tariff. On the part of sellers there is still a hardening of prices. Swansea quotations are as follows:

Bessemer Cokes, 14 x 20	9/10½	@ 10/1½
Siemens Cokes, 14 x 20	10/4½	@ 10/6
Ternes, double box	18/3	@ ..
Charcoals	11/	@ 13/

There has been quite a heavy inquiry for Black Plates for America. The stock of Tin Plate in England was at that date about 294,000 boxes.

Sheet Iron.—The coal strike, in causing the closing down of mills, has induced a strength in the Sheet Iron market that has not existed for a long time. Black iron, although not very notably active, is more so than has been the case of late, and prices are more firmly maintained. Some makers are quoting an advance, although others ask as low rates as ever. Galvanized Sheets show an improved tendency in price, with buyers urging prompt shipment on contracts. Discount on small lots from store is quoted at 75 % @ 75 and 5 %.

Chicago Report.

Scrap.—Dealers continue the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	...
Machinery Cast	6.00	...
Malleable Cast	5.00	...
Stove Plate (free of burnt)	4.00	...
Burnt Iron and Grate Bars	3.00	...
Sheet Iron and Hoops	2.00	...
Plow Steel and Breaking Stock	4.00	...
No. 2, such as Shovels, Hoes, &c.	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—One of the most active weeks ever known in the Chicago Anthracite trade has just closed. Enormous shipments were made to Missouri river points to take advantage of low freight rates, which were restored on the 28th. In addition to this exceptional demand a considerable business was done with dealers in nearer territory who are now laying in stocks for next winter, taking advantage of prevailing low prices. Carload lots of 12 net tons or over are quoted as follows:

	Egg, Sto Grate.	and Ch
Chicago, Ill	$5.00	$5 25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6 75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

HOPKINS & Co., proprietors of the New York Wire Works, at 90 West Broadway, New York, have recently rearranged their warerooms and are making a fine display of Wire Guards, Trellises, Window and Office Screens, and are showing as seasonable goods a line of Lawn Chairs and Tree Guards.

A. L. BURTIS of Lockport, N. Y., whose name many of our readers will associate with short methods of pattern cutting and other ingenuities relating to sheet metal work, is, as some of the trade know, also interested in both music and poetry. By inference we assume that he is also interested in the bicycle, for a recent issue of a local paper gives a very charming song written by him under the title "Wheeling." The writer has caught the spirit of the motion of the bicycle and transferred it in a very delicate way to the rhythm of his verse.

CONDITION OF THE

Hardware Trade.

THERE has been little change in the general situation since our last review of the market. The volume of business is moderate, and is probably diminished by the fact that the end of the month is near. Advices from the retail trade indicate that business is in most sections below the average, but that on the whole the general conditions are fairly satisfactory. While there is less building than usual there is evidently an improvement in this direction, and manufacturers of Builders' Hardware refer to a somewhat increased demand. Seasonable goods are moving in nearly the usual quantities, but even in this branch of trade there is some complaint. In the matter of prices there is little new to report. The raw material is affected somewhat by the existing strikes, but their influence has not as yet been very marked on Hardware. Nails and Barb Wire, however, and some other heavy goods are somewhat stronger in price, and on some lines higher quotations are ruling. The future course of the market is canvassed by the trade with much interest, but as yet there are no indications of an important improvement either in demand or prices in the near future. It is, however, to be expected that a fair business will be done during the next month or two, and it is hoped that in the fall business will assume good proportions.

Advices from Chicago.—The Shelf Hardware trade was further stimulated the past week by the notice of an advance in freight rates to Western points to take effect on the 28th. The Western dealers, who had been expecting low freight rates to continue indefinitely, were then impelled to hurry in their orders for immediate shipment of all classes of goods which they would require for the next two or three months. The activity thus caused has greatly increased the volume of business, but it is expected somewhat at the expense of the immediate future. It will not be surprising if trade should now prove dull for some time until the goods thus shipped are distributed. Manufacturers' agents have recently enjoyed a very much better demand for Carriage Bolts, Machine Bolts and other staple articles which have been ordered by jobbers in much larger quantities, reminding the trade of old time orders. The hardening of prices on raw material may have caused some houses to stock up with goods of this character. Recent prices have been so low that they have little to fear of any further reduction. They may have done wisely in anticipating their future requirements in this way. Roofing Plates continue as scarce as ever, and jobbers state that they are unable to accumulate any stock, the goods being shipped out about as rapidly as they are received.

Notes on Prices.

Wire Nails.—During the past week the Wire Nail market has been steady with a slightly upward tendency. Manufacturers have withdrawn their outstanding quotations at low figures and are now naming $1.15 for carload lots at mill, a figure which is sometimes slightly shaded. The advance in the price of the raw material and the uncertainty in regard to the supply of fuel are the principal reasons for the strength which characterizes this line. The volume of business has, however, fallen off perceptibly, as the trade hesitate about placing orders at the advanced

prices which are ruling, buying only in such lots as are required to meet their present needs. Small lots from store in New York are held at $1.25 to $1.30.

Advices from Chicago.—Manufacturers report rather a quiet week. The advance made in factory prices has been well maintained, but buyers are not inclined to pay the great advance now asked on recent low prices. They are able for the present to supply their wants from jobbers having heavy stocks who are willing to sell at slightly lower rates than manufacturers. This is, of course, only a temporary condition, which may soon be expected to terminate. The higher price of Steel Billets and Wire Rods will probably prevent manufacturers from being in a hurry to reduce their quotations. Factory lots are quoted at about $1.20, Chicago. Jobbers quote small lots at the same price.

Cut Nails.—The Cut Nail market is without material change, though perhaps slightly firmer in the matter of price, in sympathy with the advances which have been made in Wire Nails. The demand is fair, but not especially heavy. The Eastern market is represented by the quotation of 95 cents to $1 for Nails delivered on dock in New York. Small lots from store are held at $1.10 to $1.15.

Advices from Chicago.—The condition of the market continues about as reported last week. Orders are coming in fairly well from jobbers in this vicinity and from various Northwestern points. Manufacturers quote 90 to 95 cents on 55 cent average. Small lots are selling at $1.05 to $1.10 from stock.

Barb Wire.—The demand is only moderate, but manufacturers are well supplied with orders. Prices are well maintained, the market being represented by the following quotations for Four Point Galvanized, delivered at the points named: Pittsburgh, $2.05 to $2.15; Cleveland, $2.10 to $2.20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.20 to $2.30.

Advices from Chicago.—The advance in Western freight rates has had some effect on the Barb Wire trade, but not as great as might be expected. Western jobbers have had previous experience in stocking up on Barb Wire in times of low freights and will not risk being caught again. Manufacturers who had made special efforts to handle a larger trade from that section did not meet with satisfactory returns. Probably they would have done better if they had at the same time cut their prices, but this they were not willing to do with the higher rates ruling on their raw materials. Only a fair business is consequently reported for the week. Manufacturers are now looking forward to a quiet season extending over the summer months. Prices are maintained on a basis of $2 30 to $2.40 for small lots of Galvanized Barb Wire from stock, with 10 cents less for carloads.

Cordage.—The Cordage market continues in excellent condition as regards price, the advances which were recently made being well maintained. The demand is fair, but not especially heavy. It is thought not unlikely that slightly higher prices may rule before long.

Dixon's Cycle Lubricant.—This article is put on the market by the Joseph Dixon Crucible Company, Jersey City, N.J. In single gross quantities the price to the trade is $7.50 per gross, and in 5-gross quantities and over $6 per gross.

Phenix Meat Cutters.—Phenix Meat Cutters, manufactured by Sargent & Co., 37 Chambers street, New York, are sold at a discount of 66⅔ per cent. from the following list:

With Clamp, Galvanized.

	Per dozen.
No. 130, small family size	$48
No. 131, large family size	72
No. 132, very large size	120

With Feet, Galvanized.

No. 141, large family size	$60
No. 142, very large size	96

Glass.—The continued bad weather of the past week further curtailed the demand for Glass, though quotations for American Window Glass remain firm at 85 per cent. discount for single and 85 and 5 per cent. for double strength, in car lots. If the coal situation continues as at present it will seriously affect Glass factories depending upon coal for fuel and further decrease production. Plate Glass is quoted at 70 and 10 and 5 per cent. discount, with somewhat of a falling off in demand.

Old Metals.—There is no business of any amount in Old Metals, and prices are unchanged at their former level. The following quotations represent about the prices paid by dealers in this city:

Heavy Copper	₩ lb	6¾¢
Light and Tinned Copper	₩ lb	6 ¢
Heavy Brass	₩ lb	4½¢
Light Brass	₩ lb	3¾¢
Lead	₩ lb	2½¢
Tea Lead	₩ lb	2¼¢
Zinc	₩ lb	2 ¢
No. 1 Pewter	₩ lb	12 ¢
No. 2 Pewter	₩ lb	6 ¢
Wrought Scrap Iron	₩ gross ton	$7.00
Heavy Cast Scrap	₩ gross ton	7.00
Stove Plate Scrap	₩ gross ton	3.50
Burnt Iron	₩ gross ton	2.50

Old Rags, Paper, &c.—The volume of business does not expand to any extent. The market for Paper Stock is quiet, and only small lots are changing hands. Quotations for Old Rags, Paper, &c., are as follows, New York delivery:

No. 1 White Rags	₩ lb	3¼	@	3½¢
No. 2 White Rags	₩ lb	2	@	2½¢
Mixed Rags	₩ lb		@	2¼¢
Blues and 3ds	₩ lb	1	@	1¼¢
Hard Sized White Shavings	₩ lb	2½	@	2¾¢
No. 1 White Book Shavings	₩ lb	1¾	@	2⅛¢
No. 2 White Book Shavings	₩ lb	1⅛	@	1½¢
Light Book Shavings	₩ lb			¾¢
No. 1 Mixed Shavings	₩ lb	1	@	1¼¢
No. 2 Mixed Shavings	₩ lb	¾	@	1 ¢
No. 1 Printed Books	₩ lb	1	@	1¼¢
Ordinary Mixed Books	₩ lb	½	@	¾¢
Newspapers	₩ lb			2-5¢
No. 1 Manila Paper	₩ lb	¾	@	1 ¢
No. 2 Manila Paper	₩ lb	⅝	@	¾¢
Bogus Paper	₩ lb			½¢
Common Paper	₩ lb			⅜¢
Straw Chips	₩ lb			½¢
Binders' Clippings	₩ lb			½¢
Jute Butts	₩ lb	1⅞	@	2 ¢
No. 1 Jute Bagging	₩ lb	1	@	1¼¢
Mixed Bagging	₩ lb	¾	@	1 ¢
No. 2 Bagging	₩ lb	½	@	¾¢
Hemp Twine	₩ lb	2	@	2¼¢
Manila Rope	₩ lb	2⅛	@	2¼¢
Jute Rope	₩ lb	1½	@	1¾¢
Mixed Rope	₩ lb	¾	@	⅞¢

Old Rubber.—The market is irregular and somewhat dull. Prices are soft, the following being the nominal quotations, New York delivery:

Car Springs, ton lots, ₩ lb.	@	$0.03½	
Rubber Shoes, carloads, delivered at factory, ₩ lb.	@	.03½	
Rubber shoes, less than carloads, ₩ lb	@	.03¼	
Large Hose, ₩ ton	@	12.00	
White Wringer Rolls, ₩ lb.	@	.03¾	
White Syringes, ₩ lb	@	.03¾	

The Crandall & Godley Company, 157–159 Franklin street, New York, are issuing a catalogue of Ice Cream Utensils and Machinery, showing Freezers, Storage Cans, Molds, Ice Crushers and the various paraphernalia needed in the manufacture and serving of ice cream.

Trade Notes.

A price list of interest to furnacemen will be found in this issue, in the advertisement of the Excelsior Steel Furnace Company, 38 West Monroe street, Chicago. Prices are given of all sizes of Hot Air Pipe, Elbows, Angles, Dampers, Safety Thimbles, Plaster Collars, Finishing Collars, Box Collars, Stack Collars and Boot Collars. A cut is also shown of a new Hot Air Damper. The coupon is again printed, worth $1 on a first order for $10 or over.

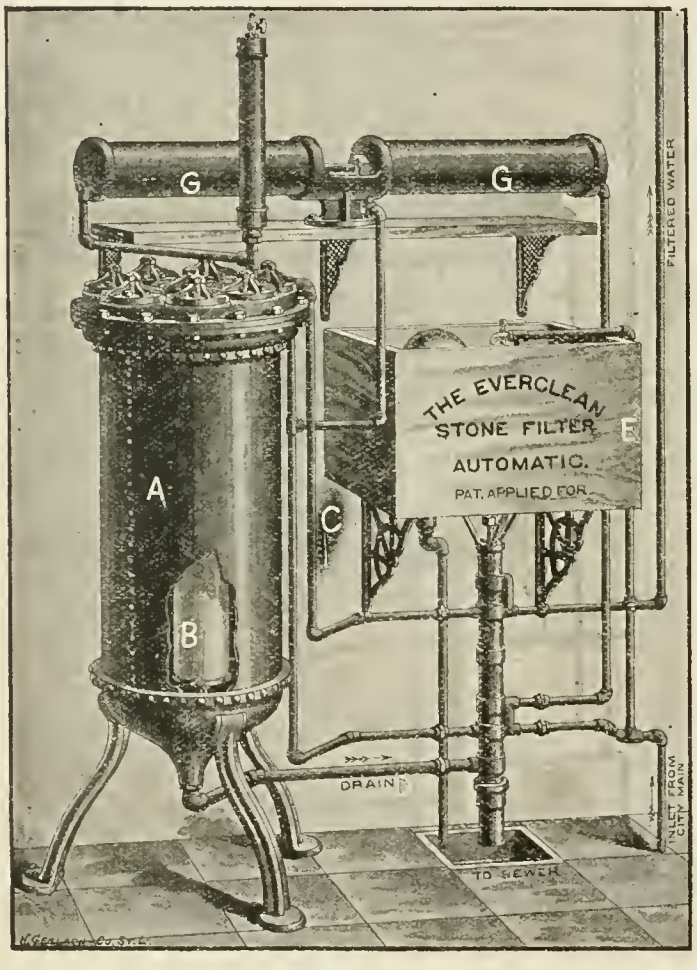
C. Mackintosh, who has had charge of the New York office of the McDaniel & Harvey Company for the past five years, severs his connection with them June 1. Mr. Mackintosh hereafter will be located in his own office at 61 Beekman street, New York, where he will transact a general commission business in Galvanized and Black Sheets and Spanish Tile for the Cuba trade, also handling Black Plates for tinning. We understand that Mr. Mackintosh will buy for a number of large concerns in New York and the New England States.

Albany Nickel Plating and Manufacturing Works, C. H. Angus, proprietor, Albany, N. Y., call attention to their superior facilities for nickel and brass plating and finishing, bronzing, tinning and japanning. The plant is also equipped with all the most approved appliances for doing every kind of polishing, plating, finishing and coloring. Mr. Angus is also prepared to do all kinds of machine work, manufacturing or jobbing, and makes the following remarks concerning his machine shop, brass foundry, &c.: The machine shop is furnished with modern labor saving tools, insuring the rapid and accurate execution of work. Particular attention will be given to manufacturing Specialties and Light Machinery, and correspondence is solicited with those desiring to contract in this line. The plant includes a first-class Brass foundry, and Brass Castings of all kinds will be furnished on short notice, guaranteed smooth and sound, true to pattern and of the best metal. Brass Gates and Rails, Store and Showcase Fixtures, Brass and Nickel Signs of any style and design made promptly to order. Where articles are produced complete in one establishment, carefully arranged for easy and rapid production, under the personal supervision of its head, it is obvious that better and cheaper work will be secured than where they are produced by different concerns. My facilities enable me to offer this advantage to my patrons.

Four new steamships are to be built in England for employment in the Anglo Canadian mail service in connection with the Canadian Pacific line. The vessels will be 572 feet in length, 62 feet beam, with a depth of hold of 42 feet and a load draft of 30 feet, making them the deepest transatlantic vessels afloat. This draft of water is rendered possible by the fact that the English and Canadian harbors have deeper water than the harbor of New York. The freight carrying capacity of each of the new ships will be 3550 tons, in addition to a coal bunker capacity of 3000 tons. The engines are to be of 21,000 horsepower, working the vessels to a speed of 20 knots an hour.

The Everclean Stone Filter.

The Stifel-O'Neil Home Comfort Company, 904 Pine street, St. Louis, Mo., have brought out a new form of filter in which they use Missouri Tripoli as a filtering stone. The apparatus consists of a filter shell or chamber, A, into which city water under pressure is admitted. Suspended inside of this chamber are a number of cylindrical stones, B, bored through their axes and at the top connected with pipe C, which leads to the reservoir for filtered water. The city pressure forces the water through the pores of the stone into the central channel and up into the reservoir. This comprises the whole filtering process proper. To clean the filtering stones when they get coated with mud the action is reversed, and the filtered water driven back from the central channel through the pores. This forces the mud off, and by opening the pipe D at the bottom of the chamber the mud is carried off. When the cleansing is complete the mud pipe closes and the flow of water resumes its normal direction. This cleansing process is absolutely automatic and the reversal of the current can be made to take place as often as desired, once a day or once an hour. The reversal of the current is governed by a tank or cistern E with interior float and valves to regulate its periodical filling and discharge. The action of the float operates a series of cup leathers attached to a stem extending down through a brass sleeve, F, underneath the center of the tank. These cup leathers in turn serve to open and close the connection between the filter and the sewer outlet and at the same time to open a connection between the city mains and the horizontal double cylinder G G placed over the tank. When the tank fills with water the sewer connection as the filter opens allows some of the water in the filtering chamber to pass out. The city pressure enters the upper cylinder at H and drives forward a plunger by the action or which filtered water is forced from the opposite cylinder through the pipe I into and through the filtering stones. After this action the tank E empties automatically by siphonage, the discharge pipe D to the sewer closes and the filtering process is resumed through the cleaned stones as in the first instance. Upon the amount of water admitted to the tank will depend the frequency of the cleansing process.



The Everclean Stone Filter.

The increasing number of mysterious fires throughout the country, most of which might be traceable to defective insulation of electric light wires, have stirred up the insurance companies to stimulated action in this matter. An insurance journal records the fact that in the city of Hartford, Conn., the Board of Fire Underwriters have recently employed an expert to make a thorough inspection, with the result of finding 57 stores and offices in the business part of the city, including two large hotels, utterly unsafe from defects in insulation of the electric light wiring. Similar conditions, no doubt, prevail in other cities.

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Metal and Miscellaneous Prices.

CHICAGO, MAY 31, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Kelyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 8.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 6.25
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.60
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.60
	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.85
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal extra, IC, 14 x 20.... 7.25
Merlon, IC, 14 x 20.... 7.00
Almond, IC, 14 x 20.... 6.50
Mint, IC, 14 x 20.... 6.25

Coke Plates.—Bright.

Elwood —IC, 14 x 20.....$6.00
IC, 20 x 28.....12.50

Roofing Plates.

Palm, IC, 20 x 28.....@$11.50
Palm, IX, 20 x 28.....@ 14.00
Empire, IC, 20 x 28.....@12.00
Empire, IX, 20 x 28.....@15.00
Hickory, IC, 20 x 28.....@ 12.50
" IX, 20 x 28.....@ 16.50
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 14.75
" IX, 20 x 28.....@ 17.25

Westmoreland:
IC, 14 x 20..... $6.00
IC, 20 x 28..... 12.00

Elwood:
IC, 20 x 28..... $11 50

Kenwood:
IC, 20 x 28..... $11.50

Furmston:
IC, 20 x 28..... ...$11.00

Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50

Illinois, Old Method:
IC, 20 x 28.....$17.00

E. L.:
IC, 20 x 28..... ....$12.50

Jessie:
IC, 20 x 28.....$12.00

Scott's Extra Costed, Stamped and Resqured, IC, 14 x 20.....$9.50

Scott's Extra Coated, Stamped and Resqured, IX, 14 x 20 .....11.00

Scott's Extra Coated, Stamped and Resqured, IC, 20 x 28.....19.00

Scott's Extra Coated, Stamped and Resqured, IX, 20 x 28.....22.00

Neville, Stamped, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28..... 12.50
" " IX, 20 x 28..... 15.00

Taylor's Old Style, IC, 14 x 20 (Stamped and Resqured).....$9.50

Taylor's Old Style, IC, 20 x 28 (Stamped and Resqured).....19.00

Taylor's Roofing, IC, 14 x 20 (Stamped and Resqured)..... 8.25

Taylor's Roofing, IC, 20 x 28 (Stamped and Resqured).....16.50

Columbia, IC, 14 x 20 (Stamped).... 7.25
" IC, 20 x 28 (Stamped)....14.50

Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped)..... 13.50

Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28..... 13.00

Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28..... 12.50

Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 ..... 12.00

Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
" (Redipped), IC, 20 x 28 .....17.00

Old Process:
IC, 14 x 20..... 9.25
IX, 14 x 20..... 11.25
IC, 20 x 28..... 18.50
IX, 20 x 28..... 22.50

H. B. L., Old Style:
IC, 14 x 20..... 7.75
IX, 14 x 20..... 9 25
IC, 20 x 28..... 15.50
IX, 20 x 28..... 18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 3-10¢	3 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5-10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢ dis. 5%

Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis.75@5%

Copper—

Ingot.

Lake.....10¼¢ @ 11¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.) (To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch..... .....$0.35
Plain, ⅝ inch up to ¾ inch..... .33
Plain, ½ inch up to ⅝ inch ..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch 48
Plain, ¼ inch up to 5-16 inch ..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter..... .... 4¢

Sheet Zinc—

600 ℔ casks..... .....4.50℔
300 ℔ casks.....4.70℔
Loose sheets.....4.80℔

Lead—

Soft Pig Lead.....4 ¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....13¢
Hallett's.....12¢

Wrought-Iron Pipe—

1¼ and under, Plain.....60%
1¼ and under, Galv.....50%
1½ and over, Plain.....70%
1½ and over, Galv.....57½%
Boiler Tubes, list Oct. 24, 1892.....70&10%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....37½%
Cold Drawn Seamless Steel Tubing...50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....55¢
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.50 square
Climax.....$3.35 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.50 square
Merchant & Co.'a Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ D, 2 ¢
" " Brown.....℔ D, 1½¢
" " Purple.....℔ D, 2½¢
" Ground in oil, B. Red ℔ D, 6½¢
" Ground in oil, Red..℔ D, 6½¢
" Grounnd in oil, Brown ℔ D, 5½¢
" Grounnd in oil, Purple ℔ D, 6 ¢
Linseed Oil, Boiled, in bbls.....54¢
Linseed Oil, Raw, in bbls.....51¢
Mineral Paints..... 2@4¢
Orange Mineral..... 9¾¢
Pure White Lead in Oil.....6@6½¢
Dry White Lead in bbls.....5½@5¾¢
Red Lead, American.....6@6½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ℔ gal..... ..34¢
Spirits Turpentine, in bbls., ℔ gal....36¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, JUNE 1, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:
Small lots.....℔ D, 65¢
100-℔ lots.....℔ D, 63¢
Ton lots.....℔ D, 60¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....℔ D, 63¢
100-℔ lots.....℔ D, 60¢
Ton lots.....℔ D, 55¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....℔ D, 60¢
100-℔ lots.....℔ D, 55¢
Ton lots.....℔ D, 50¢

Antimony—

Cookson.....℔ D, 10¾¢
Ballett's.....℔ D, 10 ¢

Brass—

Planished..... .....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.
¾ in. up to 2 in.....	$0.35
⅝-in. up to ¾-in.....	.36
½-in. up to ⅝-in.....	.38
⅜-in. up to ½-in.....	.41
5-16-in. up to ⅜ in.....	.43
¼-in. up to 5-16-in.....	.65
3-16-in. up to ¼-in.....	1.00
⅛-in. up to 3-16-in.....	1.50
Smaller than ⅛-in. .....Special	
3 in. and larger.....Special	
2 in. to 3 in., to No. 16, inclusive, .38	

25 @ 30%

Copper and Bronze Tubing—

2¢ ℔ D more than brass.

Conductors—

Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

*Bottoms, Pits and Flats..*19¢ ℔ D, net

Ingot.

Lake.....10¼¢
Ansonia Grade Arizona.....10 ¢
Ansonia Grade Casting.....9½¢
Planished.....net
Sheet and Bolt.....15¢ ℔ D, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized..... .....85%

Stove-Pipe—

Buffalo Four-Piece.

4½	6	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized..... ....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2.50.....	2.80¢
Nos. 17 to 21	℔ D, 2.60.....	2.90¢
Nos. 22 to 24	℔ D, 2.70.....	3.00¢
Nos. 25 and 26	℔ D. 2.80.....	3.10¢
No. 27	℔ D, 2.90.....	3.20¢
No. 28	℔ D, 3 00.....	3.30¢
American B. B.	℔ D, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12½¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ D 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75@75&5%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....3½¢@4¢
Bar..... .....4½¢
Pipe..... 5¾¢, 20%

Tin Lined Pipe.....15¢, 20%
Block Tin Pipe..... .....37½¢, 20%
Sheet..... ...6¼¢, 20%
Old Lead in exchange, 2¾¢ ℔ D.

Metal Expanded—

Manufacturers' list No. 6.

Lathing 10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....30%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled..... .....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil..... 6¾ @ 7¼
Lead, Red, bbls. and ½ bbls... 6¼ @ 7
Lead, Red, kegs..... 6¾ @ 7
Ocher, American..... 1 @ 1½
Red Venetian, American..... 1½ @ 2½
Linseed Oil:
Raw, ℔ gal..... .. @ .50
Boiled..... .. @ .53
Spirits Turpentine:
In bbls..... .. @ .30½
Putty:
in barrels and ½ bbls..... .01¾ @ .01¾
in tubs..... .01⅝ @ .01¾
In tin cans..... .01¾ @ .02¼
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ℔ ton.....$30.00@$35.00
Asphaltum, Rock, ℔ ton.....$14.00
Coal Tar Felt, 1 Ply, ℔ D..... .2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft. $1.85
Roofing Pitch, ℔ bbl.....$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼¢	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	48½¢

Rosin—

Common and Good—Strained
Rosin, C. & D.....₩ bbl. $1.32@$1.33
Rosin, E. & F.....₩ bbl. $1.4 @$1.65
Rosin, G. & H.....₩ bbl. $1.80@$2.15
Rosin, I. & K.....₩ bbl. $2.40@$2.80
Rosin, M. & N.....₩ bbl $2.90@$3.10

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr.....3.70@ 4.00
Peach Bottom, ₩ sqr.....4.75@ 5.60
No. 1 Chapman, ₩ sqr.....3.90@ 4.25
Lehigh Slates, ₩ sqr.....3.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....2.60@ 2.76
Purple, ₩ sqr.....3.50@ 4.50
Unfading Green, ₩ sqr.....3.50@ 4.00
Red, ₩ sqr.....9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ½..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 600 ℔, ₩ ℔.....3½¢ } 5 % dis.
½ bbls., about 300 ℔, ₩ ℔.....4¢ }
Kegs, about 110 ℔, ₩ ℔.....4¢ }
75¢ extra for keg. }
Kegs, about 55 ℔, ₩ ℔.....4¢ }

Yager's Soldering Salts.
¼ ℔ bottles, each.....80¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔.....21½¢@22¢
Straits, pigs, ₩ ℔.....21¢@21¼¢
Straits in bars, ₩ ℔.....22¢@22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20....$7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.60
Atlantic, IC, 14 x 20..... 5.75
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.50
Columbia, IC, 14 x 20..... 7.00
Dane, IC, 14 x 20..... 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 6.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28..... 16.00
Empire, IC, 14 x 20..... 5.75
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 6.25
Fort Pitt, IC, 20 x 28..... 11.00
Globe, IC, 14 x 20..... 5.76
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resqnared), IC, 14 x 20..6.12½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Lanfman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resqnared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Roofing (Resqnared), IC, 14 x 20..... 8.25
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Newcastle Real Old Method, IC, 14x20 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20 ..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20..... 5.25
Palacio, IC, 14 x 20..... 5.56
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 8.00
Phœnix, IC, 14 x 20..... 5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resqnared), IX, 14 x 20..... 10.75
Taylor Old Style (Resqnared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20..... 5.37½
Vigilant, IC, 14 x 20..... 5.50
Waldo Redipped, IC, 14 x 20..... 6.75
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.50
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Iowa, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merion, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" " IX, 14 x 20.. .. 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" " IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7 25
Versailles, IC, 14 x 20 ....5.75
Youghiogheny, IC, 14 x 20... ... .6.00

Imported Terne Plates—

Charcoal.
MF Grade, IC, 14 x 20.....$7.50
20 x 28..... 15.00
IX, 14 x 20..... .... 8.75
20 x 28 ..... 17 50
Pontymister Grade, IC, 14 x 20..... 0 50
20 x 28.....13.00
IX, 14 x 20..... 7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20..... 5.75
20 x 28.....11.50
IX, 14 x 20..... 6 75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20.....$5.37½
20 x 28.....10.70
IX, 14 x 20..... 6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20..... 5.25
20 x 28.....10.50
IX, 14 x 20..... 6.40
20 x 28.....12.80

Imported Bright Plates—

Charcoal.
Dnty: 2.2¢ ₩ ℔.
Melyn and Cal-
land Grade. IC, 10 x 14.....$6.37½
" " IC, 12 x 12..... 6.62½
" " IC, 14 x 20..... 6.37½
" " IC, 20 x 28..... 12.75
" " IX, 10 x 14..... 8.00
" " IX, 12 x 12..... 8.25
" " IX, 14 x 20..... 8.00
" " IX, 20 x 28..... 17.00
" " DC, 12½ x 17..... 6.00
" " DX, 12½ x 17..... 8.00
Allaway Grade. IC, 10 x 14..... 6.75
" " IC, 12 x 12... .... 5.87½
" " IC, 14 x 20..... 5.75
" " IC, 20 x 28..... 11.50
" " IX, 10 x 14..... 7.00
" " IX, 12 x 12..... 7.25
" " IX, 14 x 20..... 7.00
" " IX, 20 x 28..... 14.00
" DC, 12½ x 17..... 6.50
" " DX, 12½ x 17..... 6.50

Coke.
Steel Coke.—IC, 10x14, 14x20$5.25@$5.35
10x20..... 8.12½
20x28.....11.00
IX, 10x14, 14x20..... 6.60
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plates—

IXX, 14x26..(112 sheets).....$13.85
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List..... 25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks Stove—

Improved Lock Frame, per dos... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz.... 18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.. .....50&10&5%
1½ and over, Plain .....70&10&5%
1¼ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 18s2..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 ℔ casks.....₩ ℔ 5¢
Per ℔.....5¼¢

It Is Reported—

Connecticut.

That E. Ward Willis' Hardware and furniture store, at VOLUNTOWN, was destroyed by fire on the 24th inst.

Illinois.

That Sullivan & Church's Hardware store, at WYOMING, was buglarized a short time since.

That William Lichtenberger, Hardware merchant of SAVANNA, has sold out his stock and fixtures to H. C. Rhodes. Mr. Lichtenberger has been engaged in the Hardware business for 35 years, and his retirement is due to a desire to give his entire attention to the development of an invention which he has perfected. He has conducted a Hardware store in SAVANNA for 17 years, and prior to that time was identified with the business at SHANNON and FREEPORT. Mr. Rhodes will conduct the business under the style of the Savanna Hardware Company.

That Charles Penticoff is building a new Hardware store at PEARL CITY.

That the Hardware stock of F. M. Swing, MASON CITY, has been purchased by Layman & Brother of Chicago, who will consolidate with Paul Enlows under the firm name of Enlows & Layman and conduct the business at the Swing stand.

That Blatt Bros.' new Hardware building at ELWOOD is nearly ready for occupancy.

That S. W. Dutton's Hardware store at TOWER HILL was burned to the ground on the 18th inst.

Indiana.

That fire on the 18th inst. damaged the hardware store of Wendling & Priest, ROACHDALE.

Iowa.

That O. F. Griffith of MOUNT PLEASANT has sold his stock of Hardware to Fernald & Co., composed of W. D. Fernald and N. D. Fernald, the former of MAPLETON and the latter of CHICAGO. Mr. Griffith has not yet decided as to his future conrse.

That W. H. Duke & Co. have purchased the Hardware stock of McKee & Gadd, DES MOINES.

Michigan.

That a new Hardware store has been opened at UNION CITY under the firm style of Spring & Conner.

That William Urie has sold his Hardware store at BURR OAK to Mr. Bordet.

That the Gunn Hardware Company of GRAND RAPIDS have disposed of their stock to Foster, Stevens & Co. The purchase includes the entire business of the former company, both wholesale and retail. The stock will be transferred as soon as possible to Foster, Stevens & Co.'s establishment, which is large enough to amply accommodate it. It is said that the purchase price was in the neighborhood of $125,000, and that the stock will inventory about $150,000. The Gunn Hardware Company were a stock company with a capital stock of $100,000, of which $85,000 was held by W. S. and W. A. Gunn. W. S. Gunn, the founder of the business, is a wealthy man, and his object in disposing of the stock is that he may be able to devote his whole time to other more lucrative enterprises in which he is interested.

That F. W. Moon, Hardware merchant at BELLEVILLE, has sold out his business to Dodge & Spaulding of DUNDEE, who will continue it on a larger scale.

That for the past three months the Hardware store at 89 Gratiot avenue, DETROIT, owned by Geo. J. Sexauer, has been systematically robbed. On the 21st inst., however, the thief was apprehended, being caught in the act of robbery. The miscreant proved to be a former employee of the store, access being obtained by means of a false key.

Minnesota.

That the West Side Hardware Company are a new concern at NORTHFIELD

That D. Q. Minar of WILLIAMSVILLE, N. Y., has removed his entire stock of Hardware, Tinware, &c., to ORIATT, Benzie County.

That Frank McKnight, dealer in Hardware, BUFFALO, has sold out his business.

That Miller & Nelson, Hardware merchants at WINDOM, have dissolved, Carl Nelson & Co. being successors.

That H. O. Shaw has opened a new Hardware store at SARGENT.

That W. T. Wilson & Co., Hardware merchants, WEST CONCORD, have been succeeded by C. W. Webb.

Nebraska.

That the Hardware store of C. M. Hayden, at WALLACE, was entered by burglars on May 12 and a large quantity of Cutlery, Whips, &c., taken.

New York.

That the WILLIAMSVILLE Hardware business of D. Q. Minar has been removed to ORIATT, Benzie County, Minn.

Pennsylvania.

That a handsome new front has been put in the Hardware store of Hoff & Bro., READING.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, June 9, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....812 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Bidding for Work.

The great waste of time and labor by the unsuccessful bidders in making estimates of cost on plumbing work from plans and specifications is a matter that is receiving increased attention. The interest is not confined to any one locality, and the master plumbers of New York in their meetings have given it serious consideration. The reason of this wasted energy is easily pointed out, for there are a number of plans of buildings that are open for bids at the present time, each one of which finds many firms ready to make an estimate. Architects' offices are watched carefully by all builders who have ever done any work for them, and in consequence all plans are figured on by many different contractors. As in other lines, builders devote themselves to specialties, but not being busy at the present time they are eager to be employed on any character of work; consequently, an architect who has had as many as 20 or 30 different builders working for him is now besieged by all for an opportunity to figure on each set of plans he makes. From the fact that these men have previously been devoted to special lines of buildings, dwelling houses, churches or factories, as the case may be, the sub-contractors to whom they apply for bids are not the same in any two cases: and, moreover, three or four bids are often asked from each division of sub-contractors. In this way it will readily be seen that as many as 80 or 90 bids might be made for a piece of work which, perhaps, is not worth over a thousand dollars.

Taking Advantage of Bidders.

The disposition to get the most for the money in these times is shown in a case which recently transpired in an architect's office, where over 20 bids were received for a complete contract. Later it was decided to reserve a portion of the work, and with the tabulated bids exposed to the contractors they were asked to make amended bids, leaving out a specified portion of the work. It can readily be seen that the highest bidder in making an amended bid under such circumstances would be tempted to go below the figures of the lowest bidder. Some of the contractors refused to make a second bid, and others say they will never again figure on plans coming from that office. If a job is of any considerable size, the preparation of an estimate will occupy the time of a master plumber at least a week, if he devotes himself to it alone and makes a careful account of the cost, and assuming that his time is worth but a little more than a journeyman plumber, his week's labor would amount to $30. In a case where there would be 70 different plumbers making an estimate for such a contract, it can readily be seen that the cost of the bids furnished would be about $2100, which probably would be more than the price of the job, to say nothing of the profit. It is stated that in making bids in this way the reputation of a plumbing firm for doing excellent work in the most careful manner, and with only first-class materials, counts for nothing; that while the owner of the building would greatly prefer to have none but men in whom he could place confidence figure on the work, the system permits men who are incapable and unreliable to figure and stand an equal chance of securing the work. Competition was asked a short time since for the plans and specifications of a building to cost $1,000,000, for which a $50,000 prize was offered, and, as a result, 189 competitors took part. It is fair to suppose that a man competent to draw the plans and write specifications for such a building would occupy at least one month's time in the work, and in the aggregate 189 months were consumed, or 15 years 9 months. It is also fair to suppose that a man capable of doing such work would be worth a salary of $3000 or $4000 a year, at a low estimate, or $300 a month, which makes the value of the time for working out these plans nearly $57,000. The prize awarded to the successful bidder was, as stated, $50,000, which would not nearly pay for the time spent on the plan.

The Lottery Feature.

Lotteries are prohibited by the Government, yet in the case cited 189 men are striving for a $50,000 prize, each with one chance in 189 of being successful. It has been suggested that architects in charge of buildings of any considerable size should see to it that only good contractors are permitted to bid on the different parts of the work, even though the contract may be let as a whole. If the architect were to name a select number of heating contractors, plumbing contractors, roofing contractors, and so on through the whole list, who would be called upon for bids, not only would his client be better served, but much injustice, or at least needless waste of energy, would be avoided. It is said that the plumbers in one of the large cities of Rhode Island have made an arrangement with the architects by which every plumber who bids on a set of plans is paid for the time spent in preparing bids in proportion to the amount of work to be done. In this way the architect is careful to select only such men as he thinks are fitted to do his work well. The successful competitor has the amount which he has been paid for making the bid taken from the price of the work which is awarded to him. The other bidders retain the money which has been paid them for furnishing the bids. The plan, we understand, has worked very satisfactorily and is worthy of consideration. It must be borne in mind, however, in adapting any strict rules in this matter, that young firms are constantly pushing ahead, and it would be wrong to deny them a chance to bid against the established houses in the business and so win for themselves the advanced reputation and position they are seeking.

The Proposed Class in Sheet Metal Work.

Professor Richards of the Pratt Institute, Brooklyn, has received up to date about a dozen applications from candidates for the proposed class for sheet metal work in connection with the Trade School of the institute, to which reference has several times been made in these columns. A number of inquiries from prospective candidates have also come in, some of which will, it is hoped, result, later on, in definite applications for instruction. We understand that the prospect is bright for the establishment of this new branch of trade school work. Those who intend to avail themselves of an excellent opportunity of securing a thorough education in sheet metal pattern cutting should not, however, delay in sending in their applications, as the opening of the class will depend entirely upon the extent of the interest shown in it by the trade. A few more pupils must be secured before definite action will be taken in the matter. The Trade School will open in September, but applications are desired as early as possible, so that the necessary preparations may be taken in hand.

Importations of foreign bituminous coal continue. During the week cargoes have been received at New York from Wales and Nova Scotia.

THE LETTER BOX.

Automatic Ventilation of Dwellings.

From B. N., *Minneapolis, Minn.*—It has always been a source of surprise to me, in looking over the literature pertaining to hot air work, that so little is said by manufacturers and writers in general on the subject of ventilation. My opinion is that if this matter was given more attention there would be less complaint about hot air furnaces, provided, of course, that the furnace had enough heating surface to warm the air. In this locality we are forced to use ventilating devices in connection with hot air furnaces or they would not give satisfaction. Here nearly every house of the better class is back plastered, has matched sheathing and building paper under the clapboarding, is fitted with double windows and provided with storm doors or vestibules. We build as nearly air tight as possible, so that it is absolutely necessary for us to have an exhaust in order to maintain a circulation of air. Believing that what we have been obliged to do may be of benefit to hot air furnacemen in other localities, who sometimes strike knotty problems in heating to be overcome, I will briefly set forth our method of securing automatic ventilation and circulation.

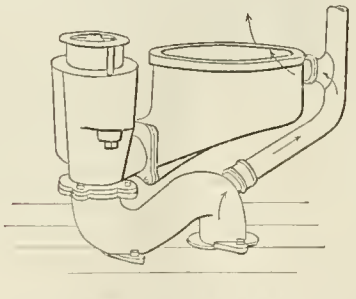
The method of which I write was introduced here some years ago by a Mr. Tilden, and is now used with various modifications by all of the leading hot air contractors. By this system the chimney flue of the furnace is made to serve the double purpose of furnishing draft for the furnace and an exhaust for ventilating pipes. For the purpose of illustration we will take a ten-room house, which is to be heated by a hot air furnace and ventilated. A large sized flue must be constructed for this purpose. It will not work if an ordinary 8 x 8 inch flue is taken. This would only furnish draft for the furnace and nothing more should be expected of it. The flue should be 12 x 16 inches, to make a really good job, in which to build an 8 inch tile stack as a special flue for the furnace. This heats the space around it into which the ventilating pipes are run. A good job, but not so permanent, can be done with a 12 x 12 inch chimney flue, with a 9 inch stack of No. 16 galvanized iron up the center for the furnace, with the ventilating pipes running into the surrounding space. Some very successful jobs have been put in with the ventilation running in the same flue as the smoke, but the flue in that case should be at least 12 x 12 inches, and a damper is required in the main ventilating pipe to shut off the air when starting a fire or when the draft is poor by reason of atmospheric disturbances.

Now, as to the arrangement of the ventilating pipes in the house. These are of tin and are usually 3¼ inches in diameter. They run from the baseboard of each room to the cellar, with 4½ x 6½ inch faces at the baseboard. In the cellar they connect with a main pipe which runs to the chimney. This is done when one flue is used for both smoke and ventilating. When the ventilating shaft is separated from the smoke flue, the vent pipes are run independently to the ventilating flue by short connections on each floor. By this arrangement an automatic system of ventilation and circulation is secured, which begins to operate as soon as a fire is kindled in the furnace, creating an upward draft in the chimney.

If the house is built with only an 8 x 8 inch flue for the furnace it should not be used for ventilation. In such a case the ventilating pipes should be run to the attic, connected into one main and run through the roof, because the flue is not large enough to serve for both purposes and the furnace will not heat on account of insufficient draft.

By-Passes: What They Are, and How to Avoid Them.

From OLIVER TWIST.—The word by-pass seems to belong exclusively to American plumbing literature, as it is seldom found in the works of authors



By-Passes: What They Are and How to Avoid Them.—Fig 1.—*A Water Closet By-Pass.*

from the other side of the Atlantic. Webster defines the word "by passage" as "a passage by the way or a by-way." As applied to plumbing practice it means a blunder in the arrangement of traps and vent pipes in a plumbing system by which the sewer gas is allowed to pass the trap and thus escape into

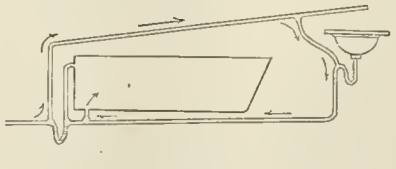


Fig. 2.—*By-Pass Between Bath and Lavatory.*

the building. Local vents or vents from the hoods of urinals, the bowls of water closets, &c., are frequently the cause of the trouble, as they are often found connected to a trap vent, as shown in Fig. 1. A similar case was seen by the writer not long ago in connection with an expensive closet of the elevated flush tank variety, having a bowl vent which was particularly desired by the owner as a sanitary measure, and yet it was allowed to be attached to the soil pipe above the highest fixture, being practically the same as Fig. 1. These vents, of course, should have been carried up separately through the roof, or to the open air. If the water from a fixture passes through more than one trap on its way to the house drain and both traps are vented there is sure to be a by-pass, as may be seen in Fig. 2. As a general rule every fixture should be furnished with a separate trap placed as near the fixture as is practicable. All traps are better if vented, even if they are of the anti-siphon pattern, as a trap that is not vented has a dead end which accumulates sewer gas, having a very corrosive action, which materially lessens the life of a trap. Laundry tubs are an exception to this rule, however, as they are usually allowed, when placed in series of two or three, to be protected by one trap. Vent pipes should be connected to the crown of the trap in all cases and on the sewer side. The word by-pass is also used in speaking of a branch taken from a water pipe, as stated in the answer to "A. J. C.," in *The Metal Worker* of May 5.

Problem in Drainage.

From M. J. F., *Minersville, Pa* —I would like to hear from the readers of *The Metal Worker* on the following subject: I want to run a drain pipe to creek which is 2 feet lower than the bottom of the cellar. The stream flows about 8 miles an hour. The question is, if I run a drain with the stream is there enough suction to keep the cellar dry when the water in the creek rises 2 feet above the level of the bottom of the cellar?

Note.—We submit this question hoping to hear from some of our readers who have had experience where the conditions were similar. The natural supposition is that water will rise to its level and if it was 2 feet higher in the creek than in the bottom of the cellar it would seem that the water would rise in the cellar to the same hight, but as the high velocity of the current will produce considerable suction a different result may be possible.

Utilizing Surplus Heat.

From F. L, *Baltimore, Md.*—I have been interested in the article of "Experimenter" in *The Metal Worker* of May 26, on heating a room over the kitchen from a range with a horizontal boiler. I would like to have some information on the subject, as I have a room to which I should like to carry hot water heat by connecting with the boiler, but I have an upright boiler. Will you kindly inform me whether I can take hot water from the top of the boiler, or if it is better to take it by a branch at the side coupling? Should the return from the radiator be connected with the cold water supply at the top of the boiler or with the pipe from the bottom of the boiler to the water back?

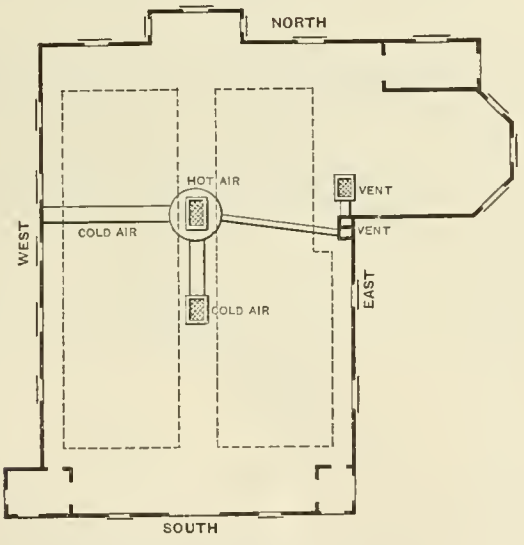
Answer.—The first thing to be considered in heating from a range boiler is whether the water back has sufficient

capacity to heat the extra amount of water required. This being decided, it is an easy matter to pipe the job. The hot water flow pipe to the radiator may be connected either with hot water service pipe at the top of the boiler or by means of a branch at the side coupling, as preferred. There are some advantages in connecting at the top of the boiler. The return pipe from the radiator should always connect with the water back pipe between the bottom of the boiler and the water back. The radiator should have an air cock at the top to let the air escape as the radiator is filled. A stop cock should be put on the pipe that leads to the radiator to prevent the radiator being heated in the summer when no heat is desired.

Wants a Better System.

The letter from "CÆSAR" is reprinted with some additional comments which came in later, as his plan, by an error, was separated from his letter in *The Metal Worker* of June 2.

From CÆSAR, *Louisville.*—In *The Metal Worker* of May 12 I note an article from "W. S. G.," Penbrook, Pa.



Wants a Better System.—Plan by Cæsar.

The only comment necessary is that "W. S. G." did not roast the architect sufficiently. The plan offered by the latter is well calculated to heat cellar to about 100° and auditorium 40° to 50°. As this is not desirable I offer the following with diagram of adjustment. I would place furnace as per diagram and take the hot air through a 30 x 36 face plate and border directly over furnace. Ten feet toward front of building I would place a register having three-fifths of the capacity of the hot air register and with pipe of three-fifths of the capacity of the hot air pipe, connecting it to a pit under the furnace. The other two fifths of the capacity of the hot air register I would use in a pipe connected to pit under furnace and run to outside air. I would place vent register as designated and give both pipe and register the same capacity as the vent flue. Let "W. S. G." use faces and borders only on this job. Such a plant will heat this building with 25 per cent. of the fuel that would be consumed in plan offered by the architect. If "W. S. G." had done the proper thing in this case he would have firmly passed the job and refused to figure on it. It is not well for a heating man to waste his time on such jobs as the one offered, in which such dense ignorance of the laws governing warm air heating is displayed. It is my experience that it requires a full lifetime of close application to learn the entirety and details of our business, yet we find some people who after four or five years' experience have mastered the details of every business. Comment is unnecessary.

It will be noticed that there are but three registers on my plan and the sum total of the cold air must equal the total of the hot air. We have a church in this city that is 136 feet long, 47 feet wide, with a mean hight of 41 feet, that is heated on this basis with less than 400 bushels of soft coal for the entire winter, and there has been a continuous fire in one or two furnaces. If any good brother is inclined to doubt this statement the job is here and open for his inspection.

Front Wall Traps.

From S. F. G., *Washington, D. C.*—In reply to the query of "L. J. S.," in *The Metal Worker* of June 2, I wish to say, after having had an experience with front wall traps in house drainage of over 20 years, I hold that they do more harm than good where the building is properly plumbed. They could be made serviceable if the vent to the top of the house were heated by gas or a hot flue, otherwise they are altogether a delusion. In this city they are mandatory and have caused no end of trouble. Their location and the method of putting them down have been changed by the inspectors many times, and the same may be said of the air inlet, which proves my assertion. Until the vent pipes are heated to force the current of air in the proper direction their purpose will be very doubtful.

From J. O. C., *Summit, N. J.*—In reply to the inquiry of "L. J. S.," New York, in regard to front wall traps, that appeared in *The Metal Worker* June 2, I would say that I am a plumber and an advocate of the trap and fresh air inlet at front wall. But instead of inside I would much prefer it on the outside, set in a brick wall with flagstone ever it, with manhole and cover and the trap to have a brass trap screw, so it can always be readily cleaned. This trap, the main trap as it is most always called, I think is an indispensable attachment to a plumbing system. To be sure it adds considerably to the cost when properly put in, but in the long run it pays for itself. When the fresh air inlet is carried 20 to 30 feet from the house, as is the case here, I fail to find any bad smells coming from it, as I don't think the flushing of any fixture in the house, with the fresh air opening 20 to 30 feet away, is sufficient to force the bad air out before a reverse action takes place and carries it, with fresh air, out at the roof.

We may take the most secure cast iron plumbing job or soil pipe and in time, owing to the expansion and contraction of the joints, it would be unable to stand the water test, thereby leaving openings for the escape of sewer gas, which would be remedied in a great measure by the main trap and fresh air inlet at the front wall. In cases of split hubs and sand hole pipe and jobs that have never stood the water test, the trap becomes an important factor, or in cases of tile pipe that has been laid with the cement joints not cleaned out and leaving rough edges inside the pipe, which hold and accumulate filth, I consider the trap a great benefit.

As the fresh air acts as a purifier, and its constant circulation through the system serves to keep the system in sweet and good order and free from any disagreeable or poisonous gases, I do not see how it can be dispensed with. In cases of repairs also where a closet or a fixture has to be so opened that the waste pipe is left open without any trap in direct connection with the room, the main trap and fresh air inlet performs an important office. As for me, I fail to see any good argument for not putting in the main trap and fresh air inlet outside front wall. It presents itself to my mind as a question of sewer gas or fresh air, and I much prefer the fresh air, which has led me to recommend at every opportunity the main trap and fresh air inlet, and I always feel that I have done my duty as near as possible from a sanitary standpoint by doing so.

Cement for Glass.

From W. P. E., *West Branch, Mich.*—Will *The Metal Worker* or some of its readers please give me the receipt for a preparation that will cement glass to tin for cream can gauges? I have tried a good many things, but without success. I can get them to hold for a short time, but when they are scalded and cleaned they begin to leak.

Note.—We trust this appeal to our practical readers will secure our correspondent the assistance he wishes. From one of the workshop receipt books the following is taken for uniting glass and metal: Melt carefully 160 parts, by weight, of finely pulverized collophony; 40 parts of white wax and 80 of colcothar. Add to the melted mass 20 parts, by weight, of Venetian turpentine. Remove from the fire and stir cement until cold with a wooden spatula. Apply the cement when warm.

THE METAL WORKER SKYLIGHT COMPETITION.

Second Prize Essay.

BY JOHN C. DRESSEL.

In making a metallic skylight, the mechanic has the same general problems to contend with that a carpenter has in constructing a hipped roof and laying out the various rafters for the same. The carpenter has a plate or foundation to start with, and the different rafters, which he terms the common rafter, hip rafter and jack rafter. So in constructing a skylight we will be compelled to impose on

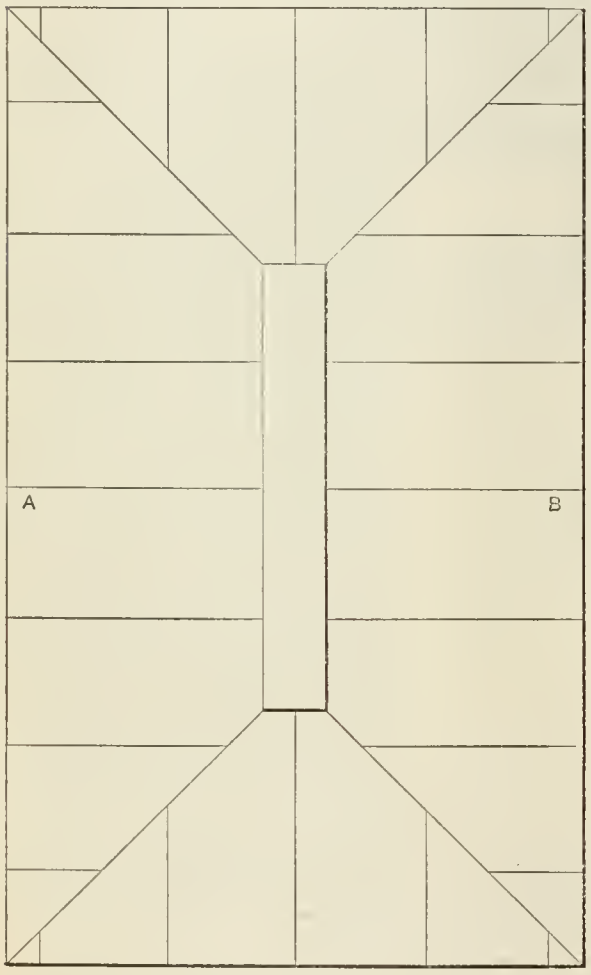


Fig. 1.

some of our carpenter friend's good nature and borrow a few of his familiar terms. Instead of using his plate we have substituted the word "curb," which will be the foundation for starting to build a skylight. Instead of using his rafters we will use bars, hence we have common, hip and jack bars.

The Metal Worker did not require a ventilator skylight, but as skylights are for the purpose of giving light in dark quarters, as dark places usually accumulate moisture, and moist places disease, there is a necessity for ventilation. We have, therefore, submitted plans and patterns for a ventilated skylight, as the same general steps are necessary to produce a light with a plain ridge as a light with a ventilator.

Let Fig. 1 be the plan of a skylight which it is desired to build.

Fig. 2 represents a sectional elevation of Fig. 1 on line A B, the pitch of the light in this case being one-third pitch.

Fig. 3 shows profile of curb bar. It will be noticed by inspection that it is formed of one piece of metal and of such a shape as to form a trough.

The various bars are attached to this curb in such a manner that all condensation will empty into this trough. By punching holes where marked in Fig. 3 the water is allowed to escape to the outside of curb. These holes should be so punched as not to come directly opposite each other, and be about ½ or ¾ inch in diameter, and should

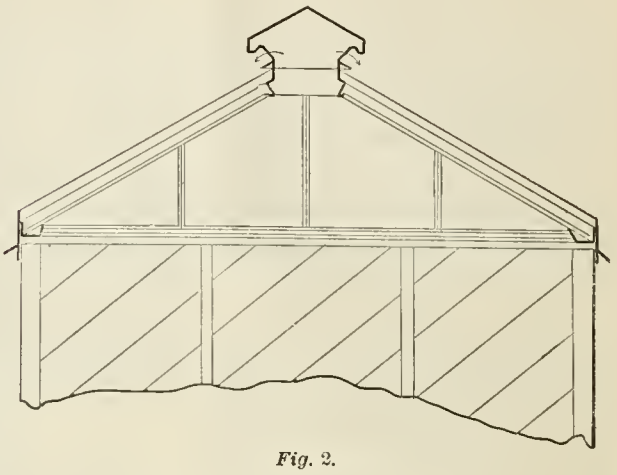


Fig. 2.

furthermore be punched before the metal is formed up. Also punch holes about ¼ inch in diameter at A to allow the escape of any water that may accumulate under the glass. These holes can be punched after the light is made up. The projection B is not really necessary, but it will be found an improvement, as it will throw the water out from the bulkhead underneath it. The manner of securing skylight to bulkhead is also indicated in Fig. 3.

Fig. 4 represents broken elevation of curb.

Fig. 5 shows profile of one of the common and jack bars. A B represents copper clip to be used in securing caps

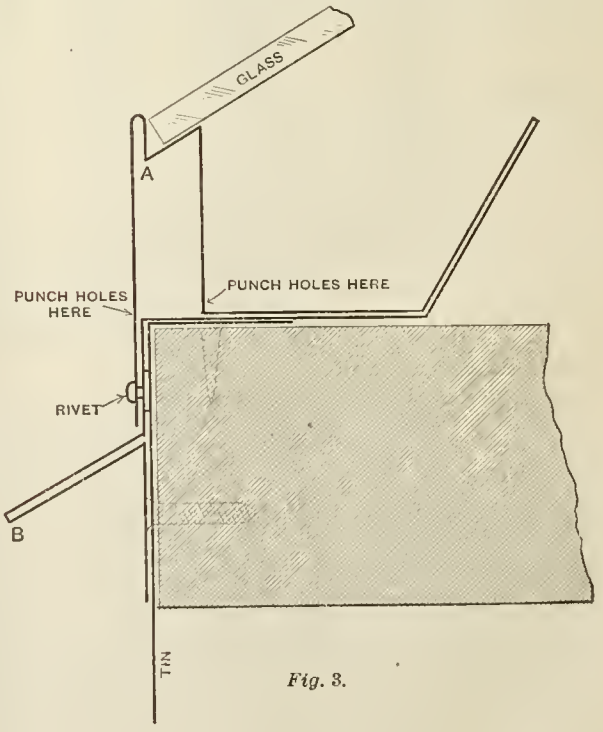


Fig. 3.

after the glass is in. The copper clip is made of sheet copper, about 14 or 16 ounce, and cut about 1½ x 2½ inches in size. The number of clips necessary to each bar is left to the option of the mechanic and as the case may require. Punch a hole, using a ½ or ⅝ inch chisel for the purpose, lengthways with the bar, and insert copper clip, as indicated by line A B, Fig. 5. By bending the ends of the cop-

per clip toward each other and hammering flat it will have the appearance of Fig. 6.

We are now ready for the cap. Let Fig. 7 represent profile of cap. Punch a hole, using same size chisel as for bar, or large enough to allow copper clip to pass through. The hole is to be punched at C, Fig. 7, and after laying glass on bar and then putting on cap we have in general appearance Fig. 8, of which Fig. 9 is a broken elevation. A B, Figs. 8 and 9, should be bent down so as to hug close to cap. It will be readily seen that in case of breakage a

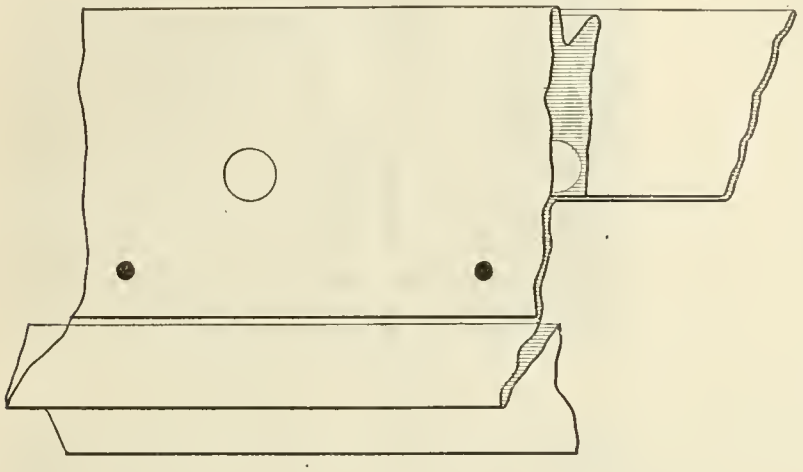


Fig. 4.

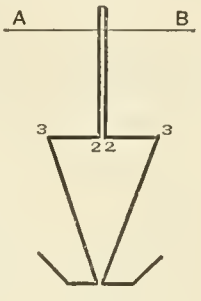
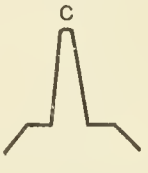


Fig. 5.



Ftg. 7.

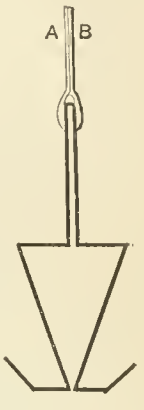


Fig. 6.

new glass may at any time be easily inserted by simply straightening the copper clip A B and removing the cap.

FINDING LENGTH OF BARS.

We are now ready to start getting out the light. Let us first ascertain the length of the various bars. Let A B E S T D, Fig. 10, represent one quarter of plan, Fig. 1, enlarged for convenience sake. At right angles to line A B lay off dotted line, as shown. On this line lay off the desired hight or pitch you wish skylight, in this case one-third pitch, as at C. Then A C will be the length of the common bars. Let me here mention that all measures are taken on the glass

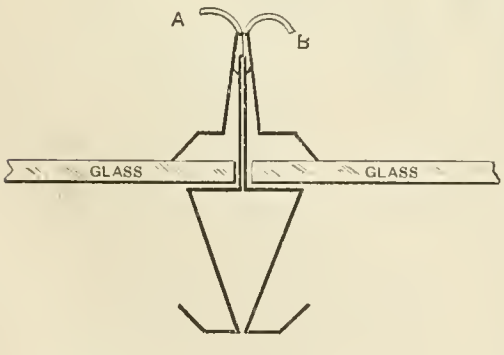


Fig. 8.

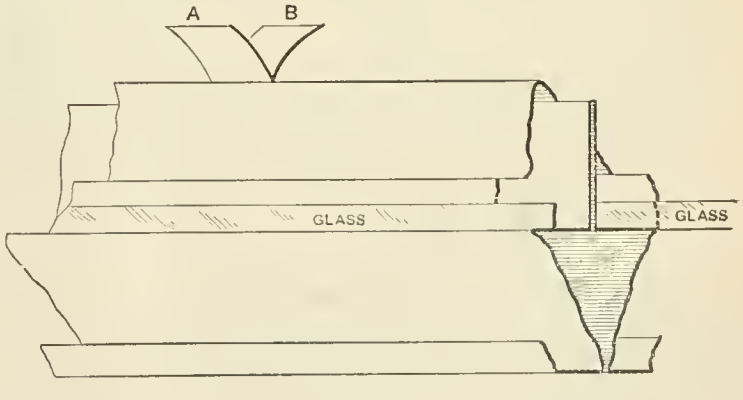


Fig. 9.

line. At right angles to D E lay off dotted line, as shown at F, making the space E F the same as the space B C. D F will therefore be the length of the hip bar. G H, J K, M N, P Q represent different jack bars, and H, K, N, Q where they intersect with hip bar.

At right angles to hip bar, line D E, lay off dotted lines from H, K, N, Q until they cut line D F, as shown by I', L', O', R'. At right angles to G H lay off dotted line I. With space eqnal to H I' lay off H I, establishing point I. G I will therefore be the length of one of the jack bars. The lengths of the others are obtained in the same manner—that is, laying off dotted lines at right angles to jack bars where they intersect with hip line D E, and making the space K L equal to K L', and space N O equal to N O', and space Q R equal to Q R'. J L will be the length of one, M O of another, and P R of another of the jack bars.

LAYING OUT PATTERN FOR CURB.

Having now established the different lengths of the various bars, we are ready to proceed with the laying out of the patterns. Let us begin with the curb or foundation, numbering the various points of curb as shown in elevation, Fig. 11. The next thing we want is a plan to obtain pattern from. At right angles to base line 5 6 drop perpendicular line 7. At right angles to line 7, at any convenient point, draw line 7', as shown; also drop perpendicular line 3. Parallel to line 7', and with space between 7' and 3' equal to space between lines 7 and 3, draw line 3', as shown. Then a line drawn as A B through the points where lines 3, 3' and 7, 7' intersect will be the necessary miter line. Drop perpendicular lines 8 6, 9 10, 1, 2, 4, 5, 13, 11, 12, cutting miter line A B, as shown. At right angles to perpendicular line 3 of elevation lay off stretchout of curb (1 to 13), as shown. At right angles to stretchout line erect perpendicular lines, as shown in pattern. Parallel to stretchout line drop lines from the various points obtained on miter line A B to their corresponding numbers on stretchout, as indicated by dotted lines. Then a line traced through the points thus obtained in stretchout will be the desired pattern.

As all measures are taken on the glass line (the glass line of curb is point 11), one would necessarily in this case want two sheets twice the length of A D, Fig. 10, with a miter on each end, also two sheets twice the length of D T, Fig. 10, with a miter on each end, measures being taken on line 11 of pattern.

The holes spoken of in Fig. 3 are shown on the pattern and should be punched as shown in pattern. The line X X

is merely to show what distance the holes are to be from the edge of the sheet, as will be readily understood by referring to Fig. 3.

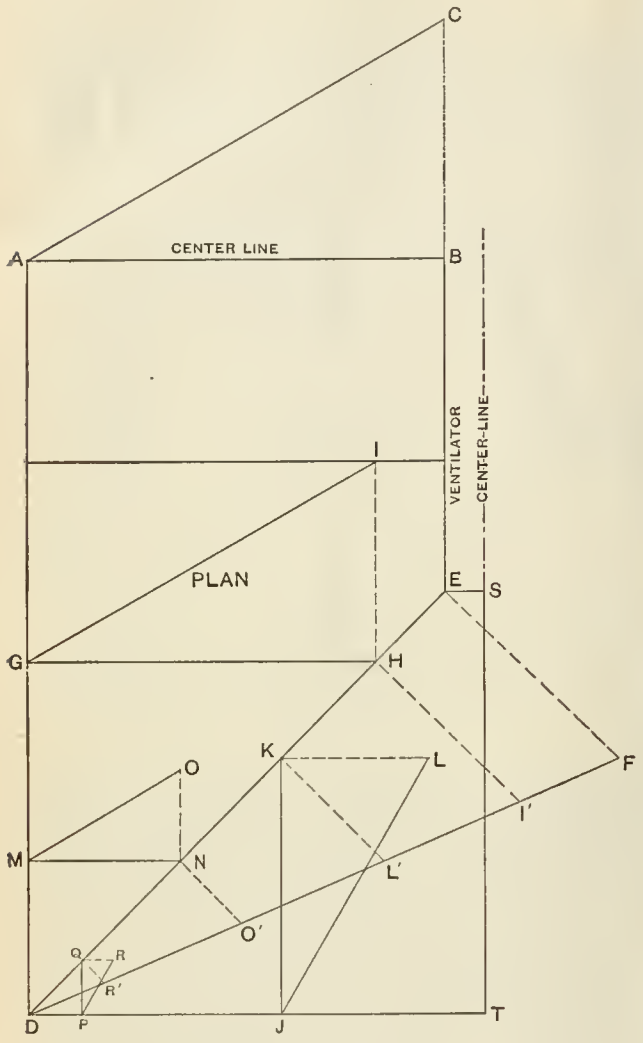


Fig. 10.

PATTERN FOR COMMON BAR.

In Fig. 13 draw line A B. At any convenient point, as at C, and at right angles to A B erect perpendicular line D, making space C D equal to space C B of Fig. 10. Also make space C E, Fig. 13, equal to line A B, Fig. 10. Then a line drawn from E to D would be the length of the common bars.

Point 11 of curb being the glass line, and the line D E being the glass line, place the profile of curb at E, as shown. At any convenient point and at right angles to line D E lay off indefinitely line F G. 2 3 of common bar, Fig. 5, being the glass line, place the profile of bar against line D E, as shown. Draw lines parallel to D E through the various points of bar profile until they intersect with curb and cut line C D, as shown. Finish drawing profile of ventilator, as shown, making glass line and condensation trough of ventilator equal to 2 3 and 4 5 of common bar. Lay off stretchout on F G, as shown. Draw lines through the various points of stretchout parallel to line D E. Then drop lines at right angles to D E, from the various points where lines of bar intersect with curb and ventilator to stretchout, as indicated by dotted lines, until they cut corresponding numbers of stretchout. Then a line drawn through the points thus obtained in stretchout will be the necessary pattern for one of the common bars.

Referring to Fig. 1, we find we want eight bars like this.

PATTERN FOR VENTILATOR.

Having the ventilator now close at hand we may as well get out the pattern for that before we proceed any further. Taking profile of ventilator produced in Fig. 13, and numbering the various points as indicated in Fig. 14, next draw center line indefinitely, as shown by line A B. On this line lay off stretchout 1 to 14, as shown. Through these points of stretchout and at right angles to A B draw lines indefinitely, as shown.

Then from the numbered points of profile drop lines to corresponding numbers in stretchout, as shown by dotted

Fig. 12

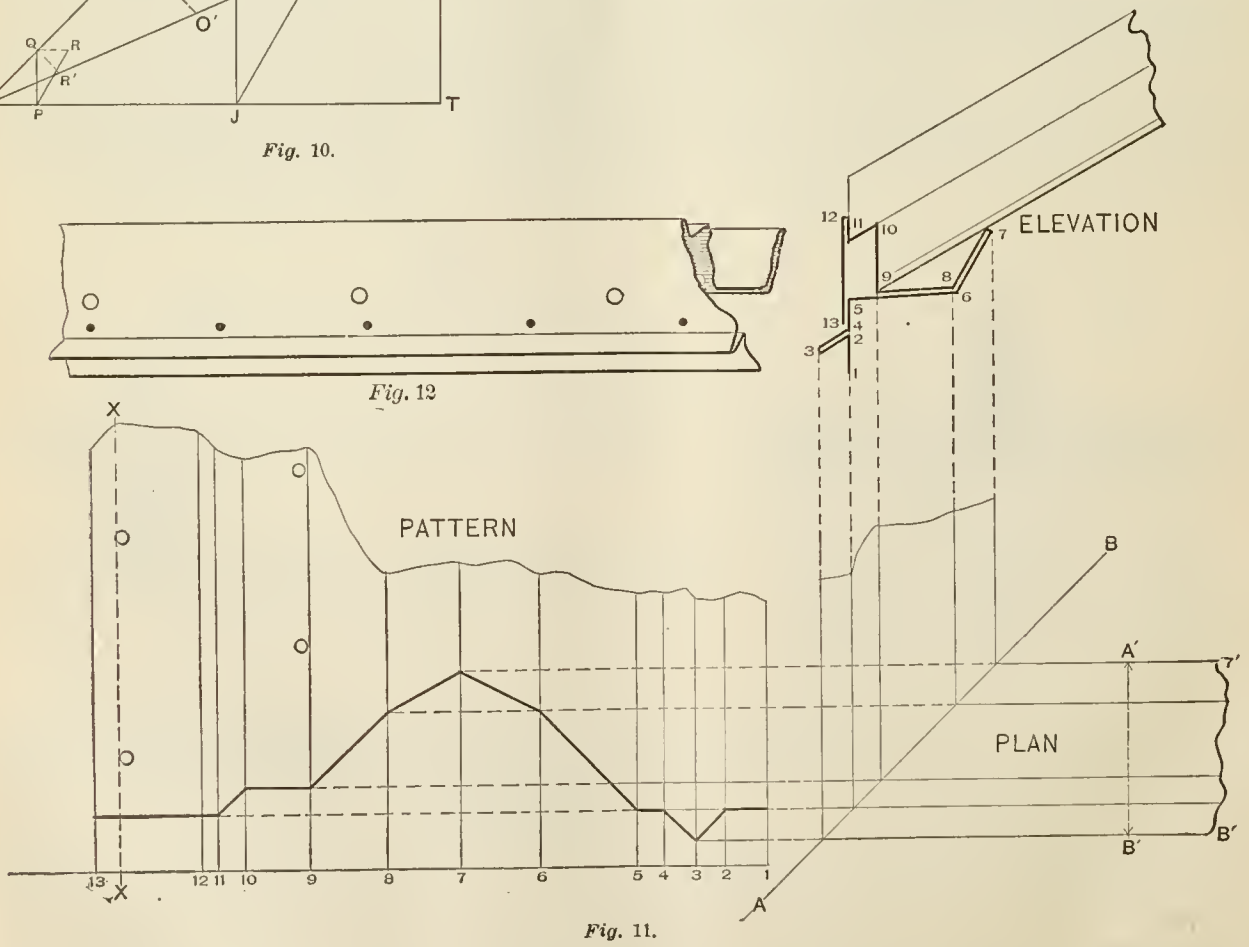


Fig. 11.

Fig. 12 again shows broken elevation of curb. It will now be necessary to have an elevation to correspond with plan of Fig. 10.

lines. Then a line drawn through the points thus obtained in stretchout will be the pattern for the end miters of sides of ventilator, point 5 being glass line. Therefore, a sheet

twice the length of E B, Fig. 10, with a miter cut on each end—that is, measuring on line 5 of pattern—will produce one side of ventilator ; or laying off the pattern on the opposite side of center line it will be found that line 5 is just twice the length of E S, Fig. 10, and, therefore, the pattern of one end of the ventilator.

C and C show side and end view of a brace, which is to be put in ventilator between the common bars. D, D represent holes for ventilation, and may be as large as the space between 8 and 9 will permit and as close together as may be desired. Fig. 15 shows broken elevation of ventilator made up. The vent holes should be backed with wire screen to prevent the entrance of insects, &c. This screen should be put on before the ventilator is put together.

It may have been observed before the reader has got thus far that these patterns are applicable to a skylight of any dimensions. The mechanic has therefore to be careful to make quarter plan, Fig. 10, to correspond with the size of skylight wanted, and make the incline of pitch the same in all cases ; or, if a different pitch of light is desired, the same general steps are necessary to produce the reqnired patterns as are necessary in this case. The only difference would be that different profiles would be produced in the curb ventilator and hip bars. Therefore, if a light of a different size but of the same pitch as the one here submitted is desired, the mechanic would only have to shift his patterns to correspond to the different lengths of the various bars, the curb and ventilator, as would be

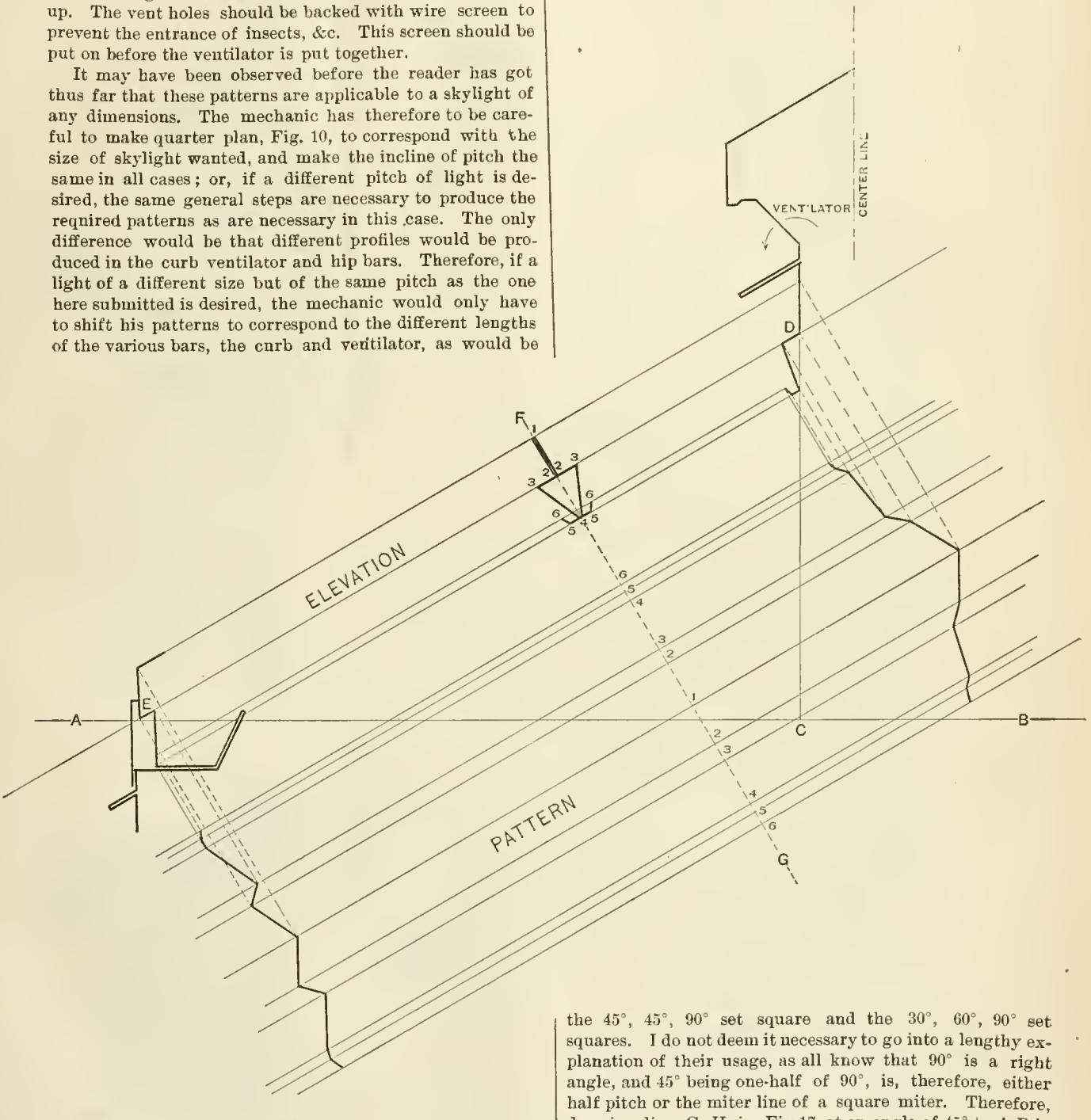


Fig. 13.

produced by a plan of a different size. The miters for the various parts will always be the same as they are in this case for the same pitch. Good judgment will therefore be necessary to make the various bars, &c., of sufficient size to carry the weight, which would necessarily be greater in a light of larger dimensions.

PROFILE OF HIP BAR.

We are now ready to produce the profile of hip bar. Fig. 16 shows the method proposed, it being drawn to correspond in size to plan, Fig. 10. Fig. 17 shows the same method as proposed in Fig. 16, the pitch in both cases being the same. Fig. 17 is drawn in detail, and as the same steps are necessary in both figures to produce the desired results, we will therefore use Fig. 17, as it will be the more readily comprehended.

Again draw elevation as in Fig. 13 (in Fig. 17 it being in detail), using only such portion of ventilator as the bars would come in contact with, as indicated by 1 2 3 4 5 6 of ventilator in Fig. 17. I believe most men who do this kind of work are accustomed to the use of the T-square and the various set squares that are used by draftsmen, such as the 45°, 45°, 90° set square and the 30°, 60°, 90° set squares. I do not deem it necessary to go into a lengthy explanation of their usage, as all know that 90° is a right angle, and 45° being one-half of 90°, is, therefore, either half pitch or the miter line of a square miter. Therefore, drawing line G H in Fig 17 at an angle of 45° to A B in elevation of same figure, we have center line of hip bar, as represented by line D E of Fig. 10.

At right angles to A B of elevation drop lines to G H in plan, as indicated by dotted lines, using only such portions of curb bar as would be required to find where hip bar would intersect with curb in plan ; also drop lines to G H, as indicated from ventilator bar. We therefore have one-half of plan. To produce the other half, lay off at right angles to lines 9, 10, 11, 12 of curb and 1, 2, 3, 4, 5, 6 of ventilator where they intersect with line G H of plan, drawing balance of plan as shown on right side of line G H.

At any convenient point draw line K L, as shown in plan, at right angles to G H. Now we necessarily want the same bearing for the glass to rest on on hip bar as we have

on the common bars. Therefore we have G H in plan as center line of hip bar; and I J in elevation as center line of common bars. Transfer the spaces 2 3, 4 5, 5 6, using line I J as center, to K L of plan, using line G H of plan as center. Through the spaces thus obtained on K L of plan, and parallel to G H, draw lines 5, 6, 3 until they intersect with plan of curb and ventilator, as shown, extending lines 3, 6 of hip bar through line 9 10 of curb bar in plan until they cut line 11 12 of curb bar.

At any convenient point and parallel to line G H of plan draw line A′ B′. At right angles to G H draw from point S the line cutting A′ B′ at S′. Also at right angles to G H of plan draw line, as shown, from point T indefinitely. With space equal to B D of elevation lay off from the line A′ B′ of diagonal section the point D′. Then a line drawn from point S′ to D′ would be the glass line of hip bar. Next draw line 5′ 6′ parallel to A′ B′, as shown in diagonal section, making the space between line A′ B′ and

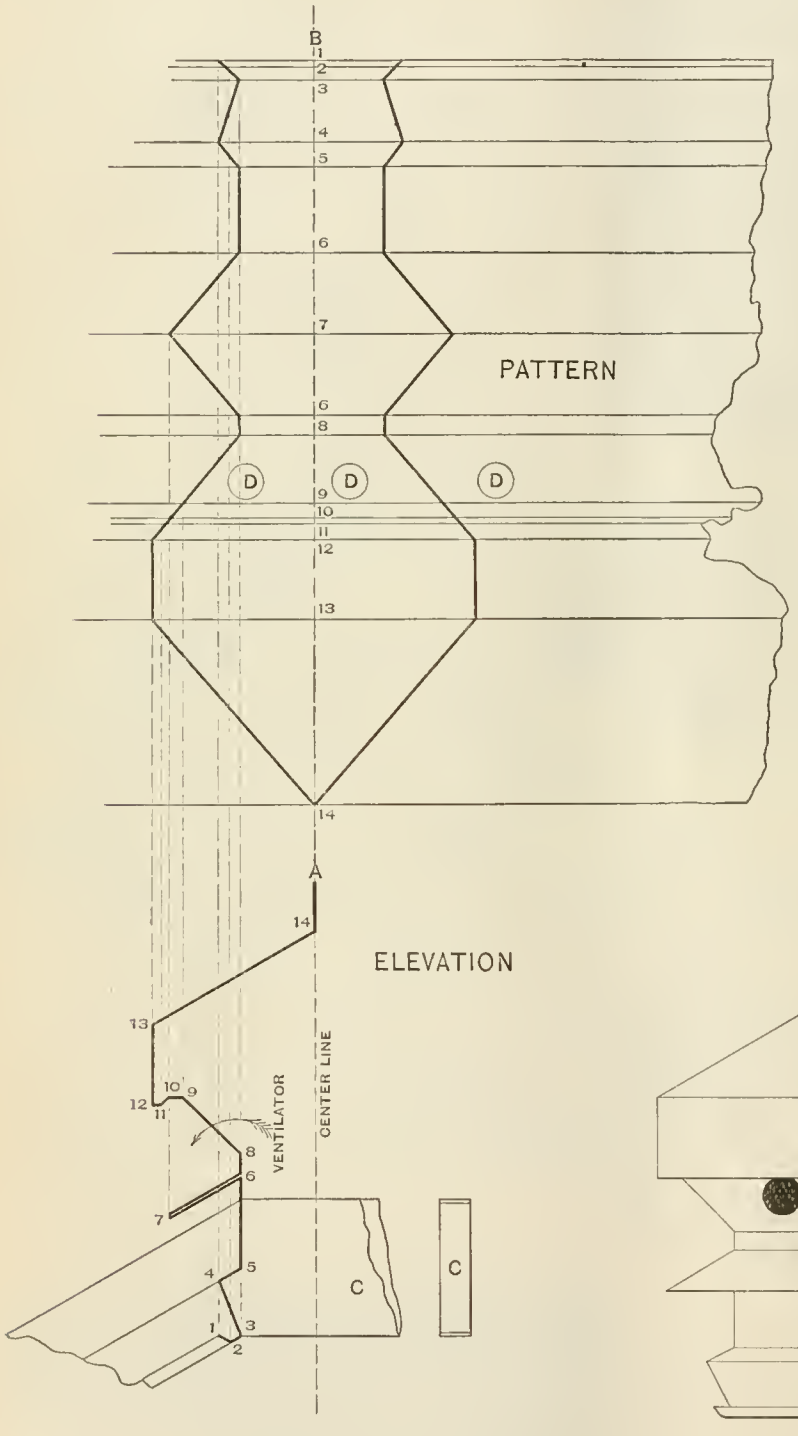


Fig. 14.

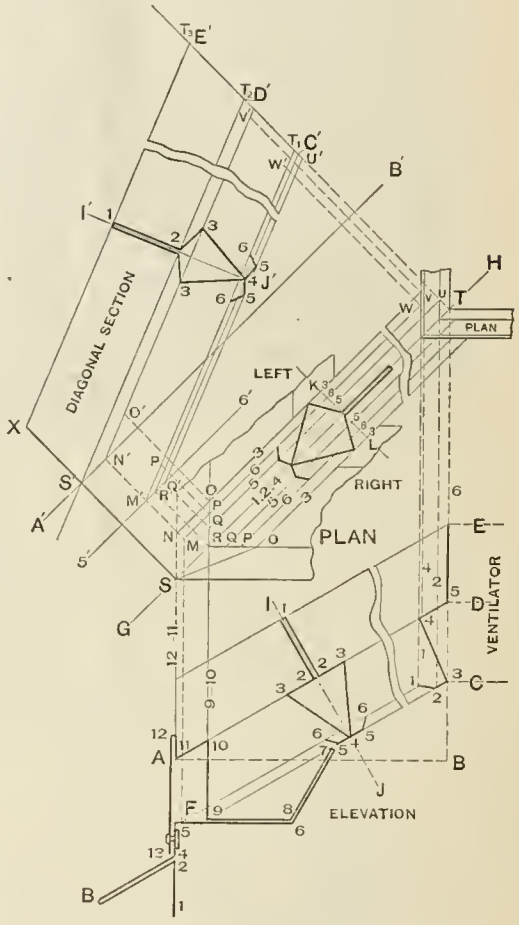


Fig. 17.

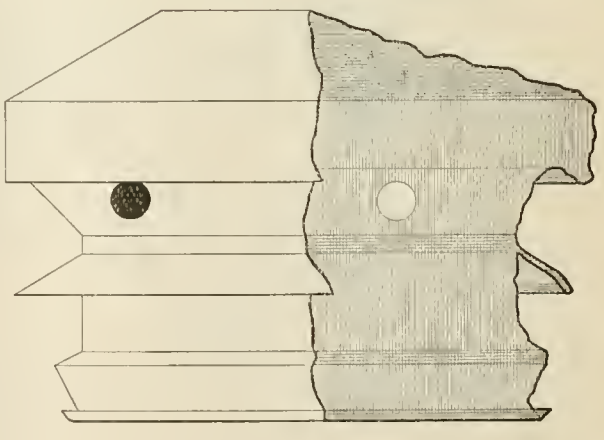


Fig. 15.

This operation is necessary to establish profile of hip bar, as will be shown later. Next extend line 6, as shown in elevation, through curb by dotted line until it strikes line 5 6 of curb at F. From F drop dotted line at right angles to A B of elevation until it cuts line 6 of plan, establishing point M in plan. We now have points S, M, N, O, P, Q, R in curb plan, of which S O P Q R is the plan of miter in curb and T V U W is plan of miter in ventilator.

It will be necessary, however, to obtain a diagonal section through hip bar before we can obtain profile of hip and the correct miter points for the pattern.

5′ 6′ equal to space between lines A B and 5 6 of elevation. At right angles to G H of plan from point M draw dotted line cutting line 5′ 6′ at M′ and cutting line A′ B′ at N′. Also draw dotted lines, as shown, from points R, Q, as shown in plan, cutting line 5′ 6′ in diagonal section at R′ Q′. From points thus obtained in diagonal section draw lines parallel to line S′ D′ until they cut the indefinite line drawn from point T in plan. Next lay off point E′ of diagonal section, making it the same distance from D′ as the space between D and E of elevation. From E′ and parallel to S′ D′ draw line cutting line S S′ at X.

We are now ready to lay out profile of hip bar. At any convenient place and at right angles to S' D' draw line I' J'. I J' is therefore the center line of profile of hip bar. With space equal to 2 3 of common bar lay off the spaces 3, 3 on the line drawn from the point N'. Then a line drawn from point 2 on center line of hip bar, diagonal section, to points 3, 3 would show the profile of that portion of hip bar upon which the glass rests.

From points 3, 3 in diagonal section draw lines to center line where it intersects with the line drawn from point R', establishing the point 4 of hip bar. Again using the line I J of elevation as center, and with space equal to 4 5, establish the points 5, 5 in diagonal section hip bar, using the line I' J' as center. Lay off points 6, 6 of hip bar on line drawn from point M', making them the same distance from the line I' J' as 6, 6 are from the line I J of elevation. Connecting points 4, 5, 5 and 5 6, 5 6, as shown, in diagonal section we have the complete profile of the hip

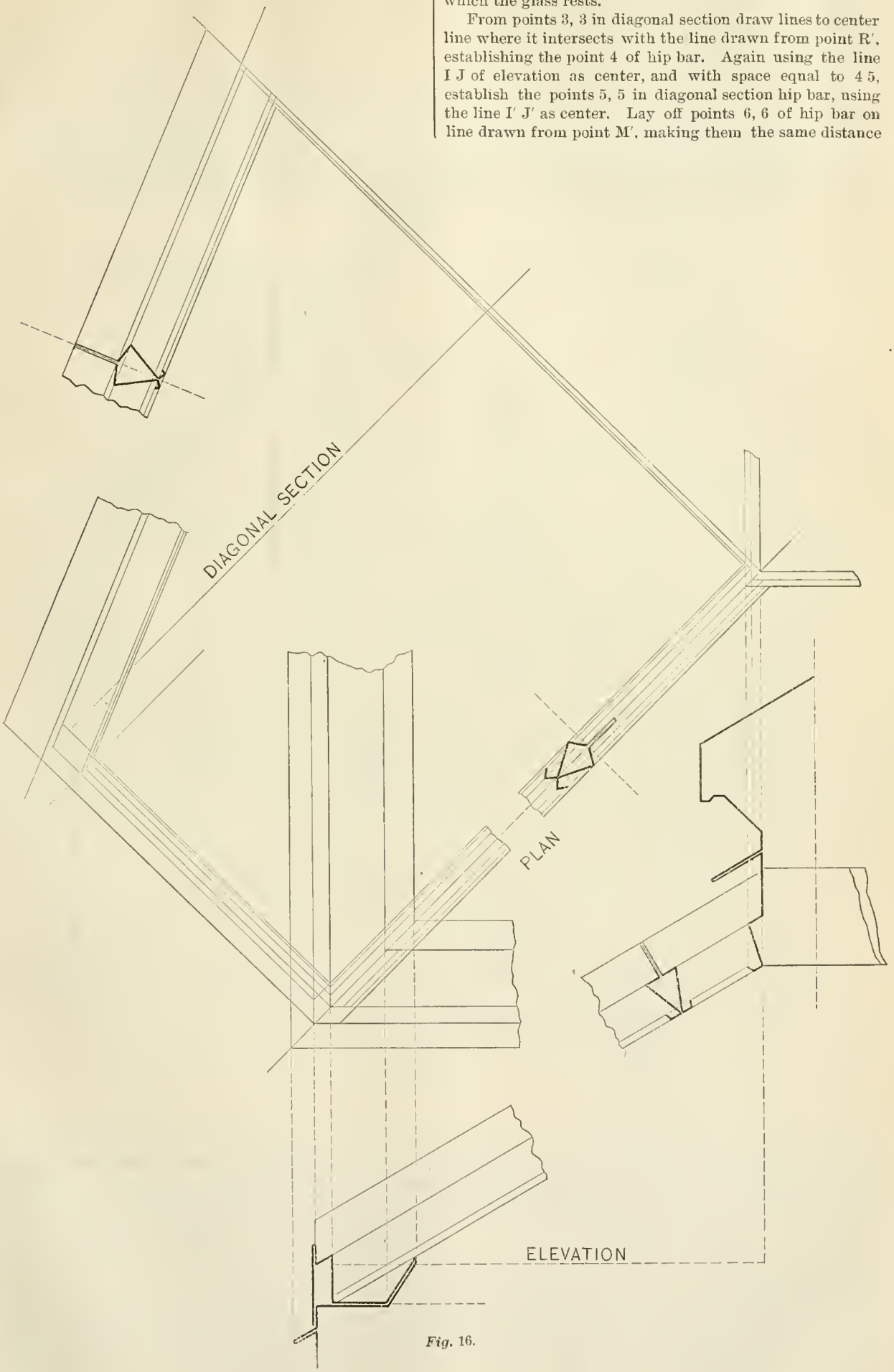


Fig. 16.

bar, which may be transferred to plan, as shown. At right angles to G H of plan drop dotted line from point O until it cuts the line drawn from point N' of diagonal section, establishing the point O'. Also, drop dotted line from point P of plan until it cuts the line drawn from point M', diagonal section, establishing point P'.

Drop lines at right angles to G H from points V, W in ventilator plan to lines drawn from points N', M', diagonal section, establishing the points V', W'.

As S, O, R, Q, P in curb plan and T, U, V, W in ventilator plan are the miter points of hip bar as they would appear in plan, and S', O', R', Q', P' of curb and T_2, V', T_1, U', W' in ventilator of diagonal section are the miter points of hip bar as they would appear in a diagonal elevation of hip, therefore the miter points of diagonal section are the correct intersections of hip bar with the curb and ventilator.

PATTERN FOR HIP BAR.

We are now ready to proceed with the laying out of the pattern for the hip bar.

In Fig. 18, exteuding center line I' J' indefinitely, as shown, at right angles to D' S', lay off stretchout of hip bar on I' J', as shown by 1, 2 2, 3 3, &c. Through these points draw lines parallel to D' S' indefinitely, as shown. Then lines dropped from X, S', O', R', Q', P' and T_3, T_2, V', T_1, U', W', at right angles to D' S', diagonal section, of Fig. 17, and as indicated by dotted lines of Fig. 18, to corresponding numbers of hip bar in the stretchont will, after tracing a line through the points so obtained in stretchout, be the necessary pattern for the hip bar. Referring to Fig. 1, we find we need four hip bars.

PATTERN FOR JACK BARS.

We now have all patterns necessary for the skylight except the pattern for the jack bars. Again taking elevation and plan, as shown in Fig. 19, at right angles to curb line 11 12 lay off the line B until it intersects with the center line of hip bar in plan, the distance from the miter line 11 12 of curb (or one corner of skylight) to line B in this case being the distance that M is from D in Fig. 10. Place the profile of the common bar on line B, as shown.

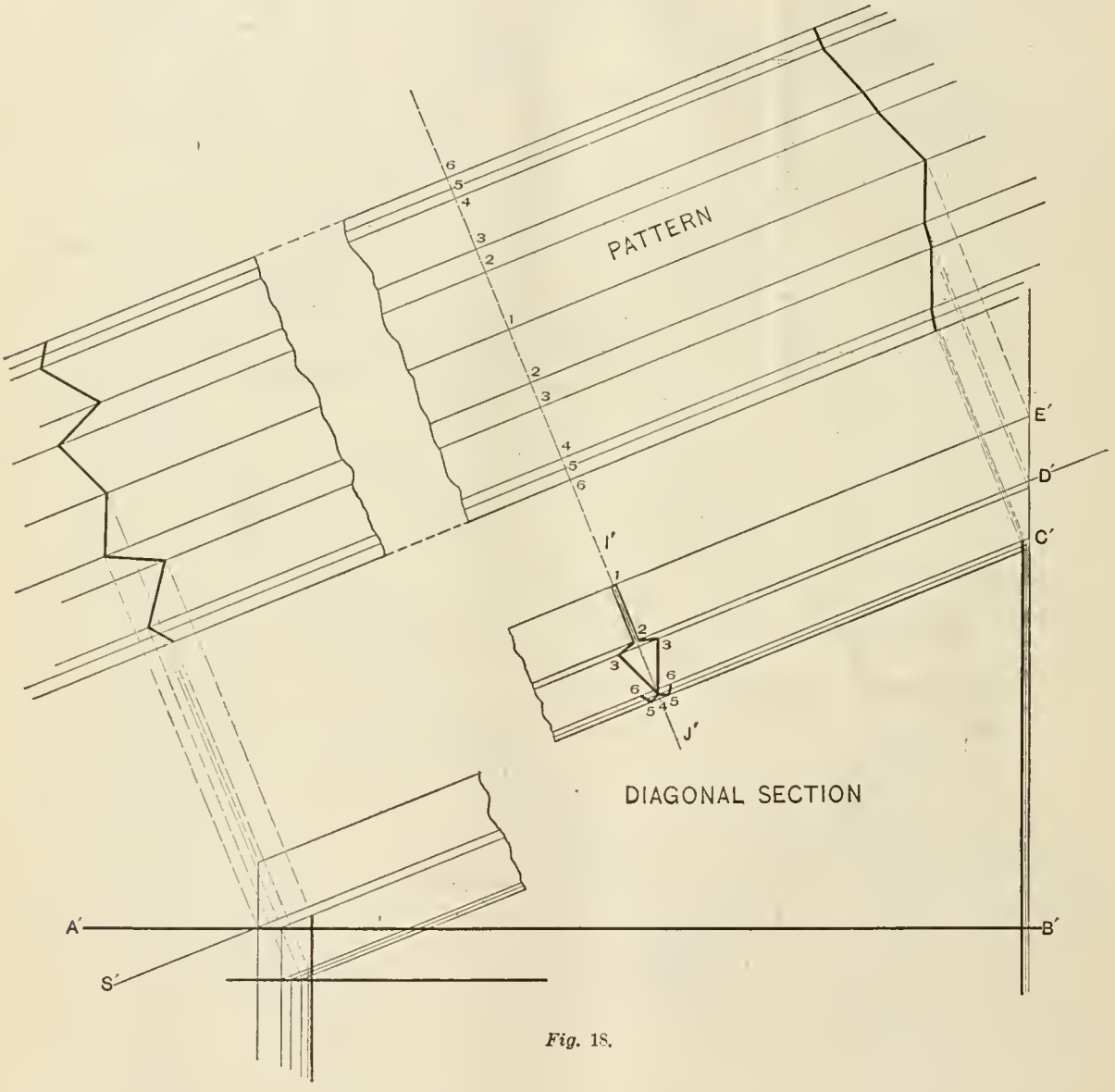


Fig. 18.

Parallel to line B drop lines through the varions points of profile of common bar until they intersect with corresponding lines of hip bar. From the points thus obtained and at right angles to liue B drop lines to corresponding lines of elevation bar—that is, line 1 of plan to intersect with line 1 of elevation, line 2 with line 2, &c., as indicated by dotted lines from plan to elevation. At right angles to elevation lay off stretchout 1, 2 2, 3 3, &c., as shown. Through these points and parallel to elevation bar draw lines indefinitely, as shown. Now from points obtained in elevation bar by lines dropped from plan and at right angles to elevation bar drop lines to corresponding lines in stretchout, as again indicated by dotted lines. Then a line traced through the points obtained in stretchout will be the desired pattern. It will be observed that the miter of the jack bar is the same

where it comes in contact with the curb as the miter of the common bars in Fig. 13. As the measuring line of the bars is on line 2, by referring to Fig. 10 (it being a quarter plan) we find we want four jack bars the length of each of the lines G I, J L, M O, and P R, 16 jack bars being required for the skylight in this case.

the right of the center line of pattern in Fig. 19 for the other side of bar.

I would suggest that laps be left on the various miters of the skylight wherever it is deemed advisable, for by so doing the maker may occasionally have an opportunity to put in a rivet and also do a much more secure job of

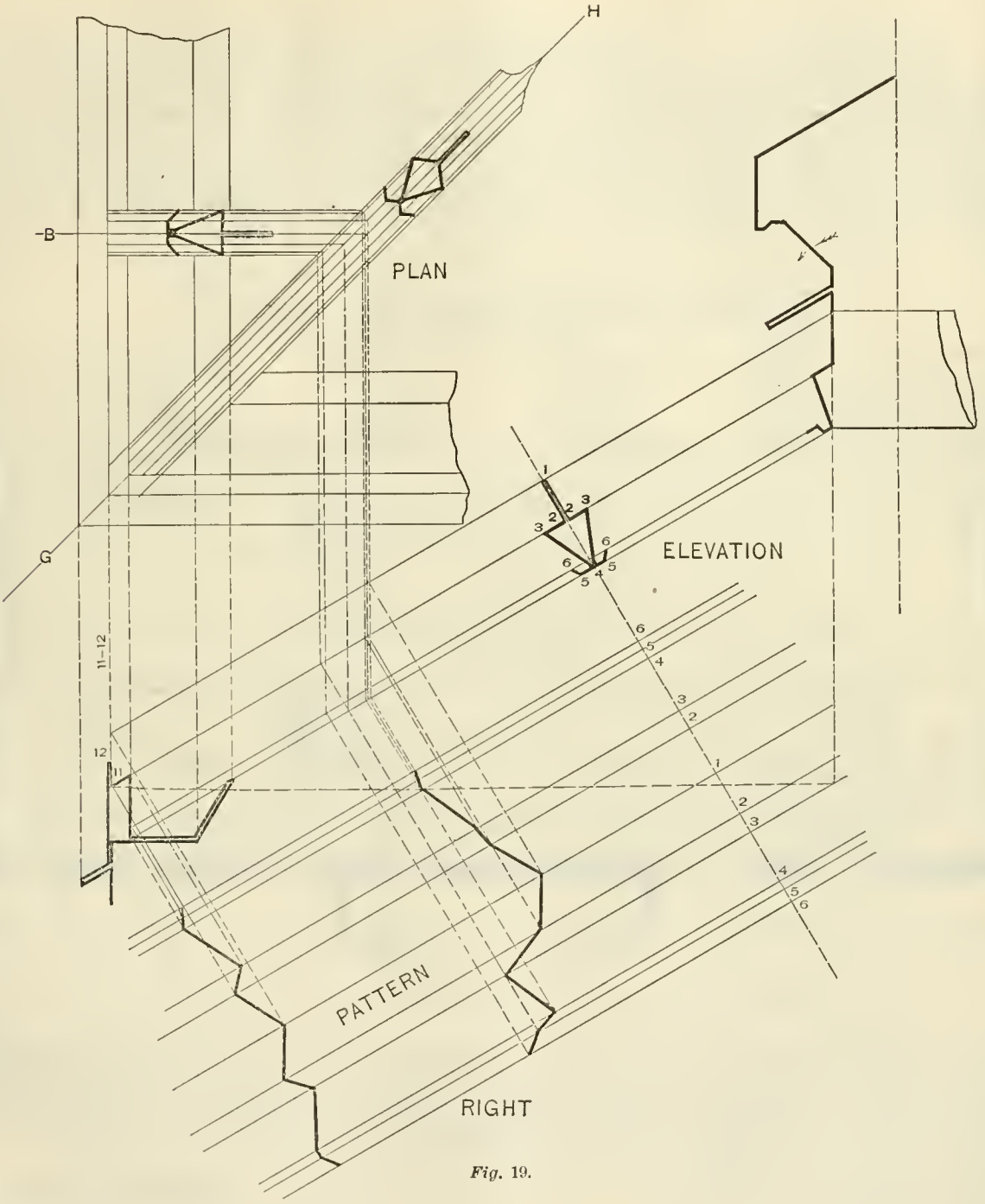


Fig. 19.

If it should so happen that a bar should intersect with the ventilator at the same point that the hip bar does, as at E, Fig. 10, one would simply have to use the half of pattern in Fig. 13 for one side of bar and the half of pattern to soldering. The bar profiles here submitted are, I think, the simplest kind in use, but it would be necessary to take the same steps as were pursued in this case to produce the patterns for any bar.

An Interesting Relic.

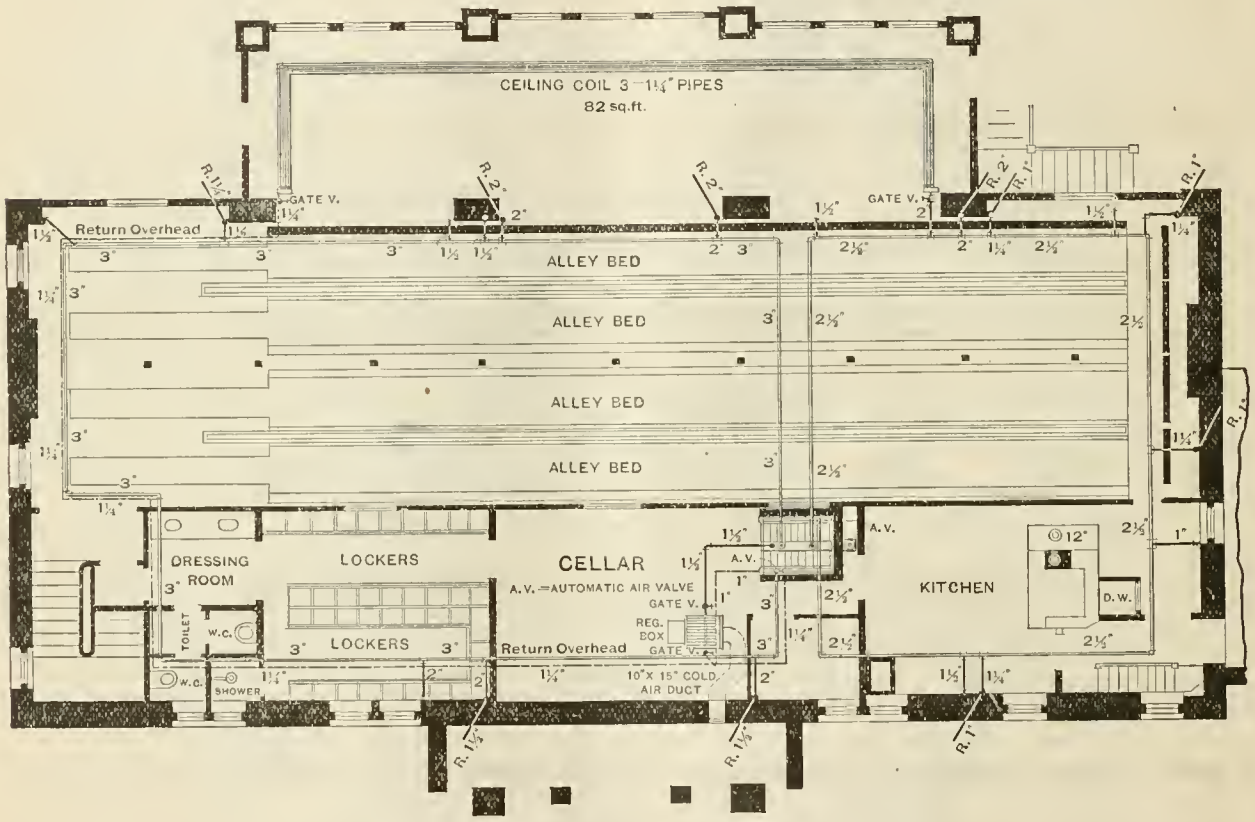
The attempt of some relic hunters to steal portions of an old boiler at Frederick, Md., has brought to light the claim of the owners and of Southern antiquarians that the boiler in question formed a part of the first boat actually propelled by steam. James Ramsey, a Maryland inventor, so runs the local statement, in 1785 conceived the idea of propelling a boat on water against the current. He devised and designed the machinery for applying steam power for this purpose, and had it forged at the old Cotoctin Furnace, near Frederick, owned and operated by Baker & Johnson. The boat was built at the Point of Rock, on the upper Potomac, and the machinery put in in the summer of 1785. The boat was worked up the Potomac to a place then called Bath, where General Washington was spending the summer. The experiment was successful, and General Washington certified that he had seen a boat actually propelled by steam at the rate of 4 or 5 miles an hour. The machinery was subsequently taken back to Cotoctin, and for two generations the boiler and the cylinder, the latter 4 inches in diameter, stood 3 feet above ground on one of the boundary marks of the Cotoctin property and Hayland, the extensive farm of William Johnson.

STEAM AND HOT WATER.

A Circuit System.

As a method of installing a steam heating plant the circuit system has grown in popularity, and as an example of such a system we show the plans, with the boiler and piping, of the club house of the Ridge Club, at Bay Ridge, Long Island. The plant was installed by W. F. Higgins & Co., 379 Lexington avenue, New York, using one of the new No. 327 Richmond sectional boilers with nine sections. The club house is situated on a slope of ground, so that the entrance to the porch and vestibule shown in Fig. 2 is from the ground level, and the floor of the basement shown in Fig. 1 is at the level of the ground at the back part. The back part of the club house faces New York Bay, and has a western exposure. The steam mains supplying the building are divided into two circuits. From the front of the boiler a 3-inch main runs to the back of the house and makes a circuit of one part of the building, and returning drops down and connects with the boiler at the right hand side at the bottom. Another main is 2½ inches in size, makes a circuit of the other part of the building, and returning connects at the bottom of the boiler on the left hand side, as shown in Fig. 1.

A third main, 1¼ inches in size, runs to an indirect radiator supplied with cold air from out of doors by means of a 10 x 15 inch air duct, and located beneath a 14 x 30 radiator in the main hall on the first floor, shown in Fig. 2. The return from this radiator is 1 inch in size, and connects at the bottom of the boiler. In the basement at the back of the building is an observation space overlooking the bowling alleys. This is heated by means of a ceiling coil composed of three 1¼-inch pipes, exposing about 80 feet of surface. A separate return is run from this coil to the boiler directly beneath the steam main, following it as it makes a circuit of the building. Risers are taken from the mains to the radiators on the first and second floors, located as shown in Figs. 2 and 3. In every case the branches or risers to the radiators are taken directly from the top of the main, as shown in Fig. 4. In running the steam mains after leaving the boiler, the pipes are so graded as to have a fall throughout the entire circuit back to the boiler, to return the condensation. Automatic air valves are placed at the boiler to relieve the circuit main of air that may accumulate. The circuit main in the basement is not covered, and serves as heating surface. Where a building is adapted for the use of the circuit system a considerable saving in pipe and labor is made, and there is little danger of trapping the pipes to interfere with satisfactory results. In this case, though the building is exposed to winds from the west after sweeping across the bay, there has been no difficulty in keeping the entire building at a comfortable temperature with the system in use.



A Circuit System.—Fig. 1.—Showing Basement, with Boiler and Piping.

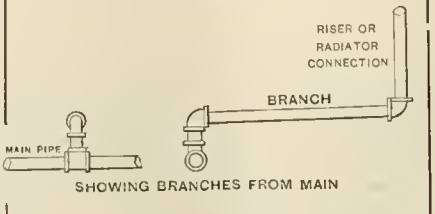


Fig. 4.—Showing Method of Connecting Branches.

HEATING NOTES.

D. F. Morgan has assumed the management of the Chicago branch of the D. F. Morgan Boiler Company, 23 and 25 West Lake street.

The monthly calendar for June distributed by M. Mahony, Troy, N.Y., is an attractive card, the central feature of which is a fishing scene. These are neat desk calendars, and will be welcomed by the trade.

The latest circulars received from the Richmond Stove Company, Norwich, Conn., are pamphlets of the Richmond steam and hot water heaters that have been issued in the interests of Davis, Wright & Co., Keene, N. H.; F. C. Weiant & Co., New Britain, Conn., and Henry Leitch, Hartford, Conn.

THE CARTON FURNACE COMPANY, Utica, N. Y., are about commencing additions to their plant to prepare for the manufacture of their line of Carton shipping room. They will also add to their foundry plant. Their first series of boilers, both steam and hot water, will be ready for the market by the middle of August, and we understand that they have already made several contracts in which these boilers will be used.

THE WILLIAMSPORT STEAM COMPANY of Williamsport, Pa., are now sending steam over all their lines except on Fourth street, from Hepburn street to Trinity Church. They cannot supply that section, as the steam pipes are under water which has not sufficiently receded.

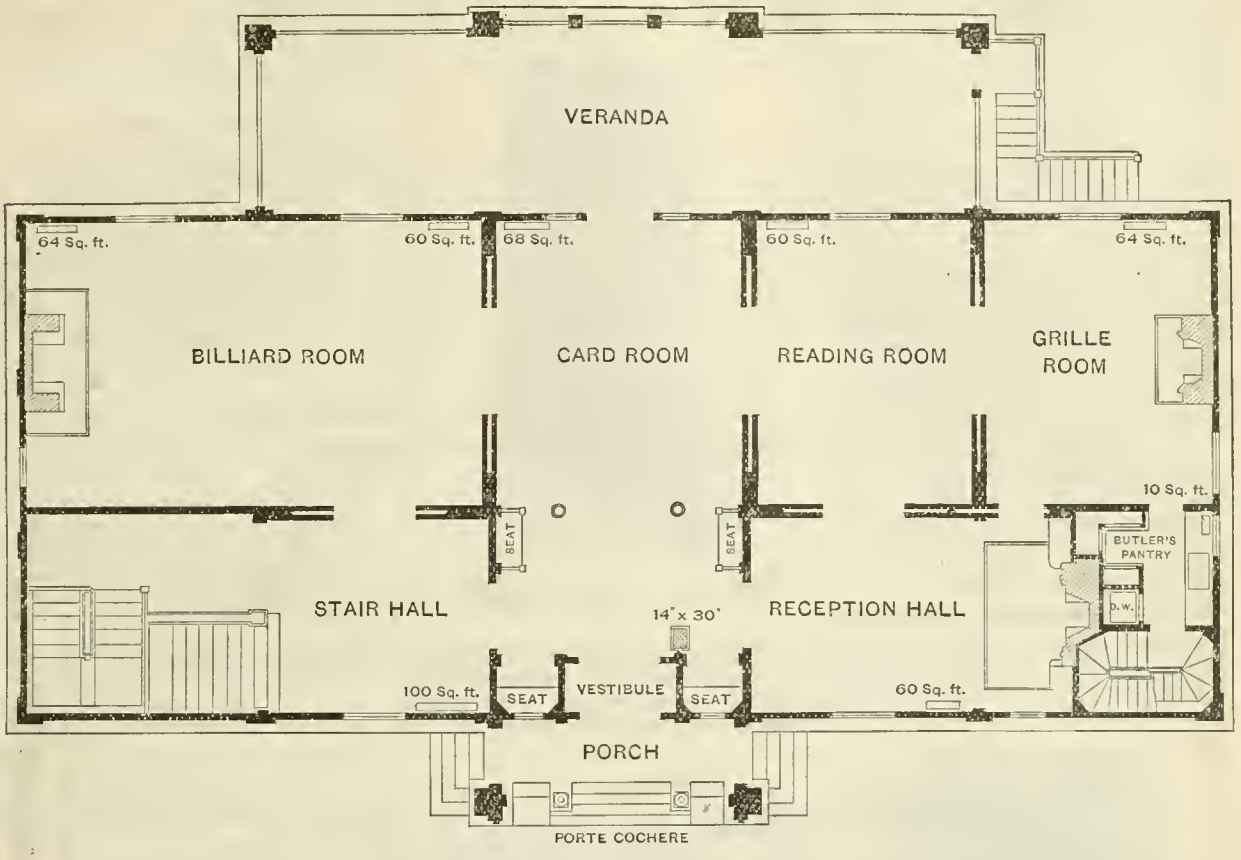


Fig. 2.—First Floor.

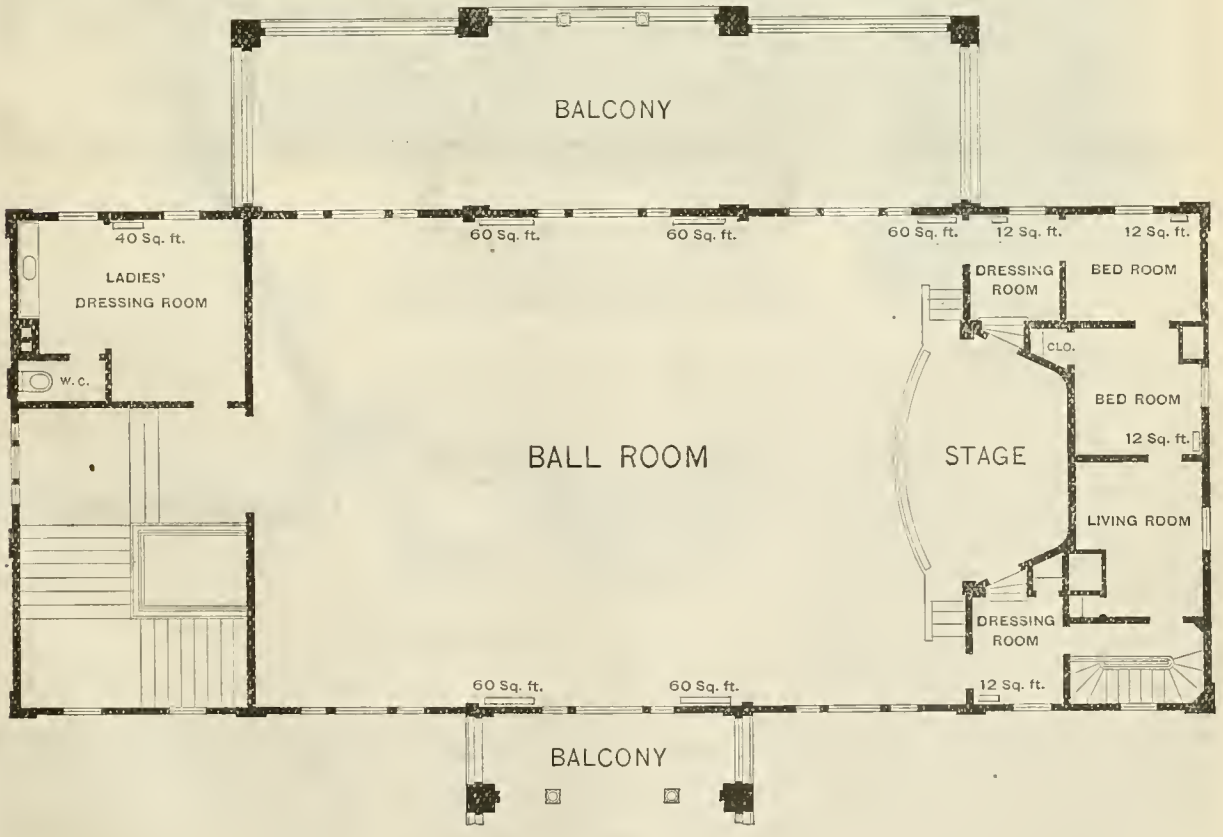


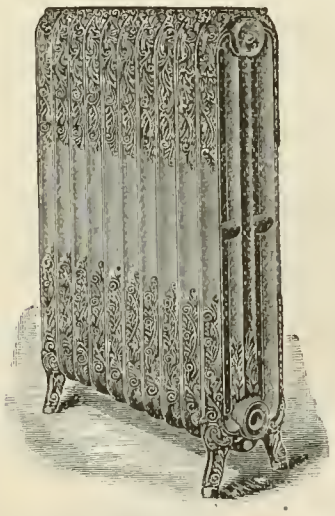
Fig. 3.—Second Floor.

The A. A. Griffino Iron Company are now comfortably established in their new quarters at 34 Dearborn street, Chicago. Manager Frank W. Somers has fitted up the offices and wareroom very tastefully. They are located on the ground floor, as at the previous location, but enjoy an advantage in sole occupancy. Samples are shown of a considerable number of the leading styles of Bundy radiators, handsomely painted and decorated. A portion of the space is occupied by specimens of the Gurney steam and hot water heaters, for which Mr. Somers is also Western agent.

The American Radiator Company, 111 and 113 Lake street, Chicago, have issued a very fine hanger, showing no less than 46 patterns of steam and hot water radiators which they manufacture at their Detroit and Buffalo factories. They embrace a very great variety of kinds and styles, shapes and sizes. Two colors are used in printing the hanger, which is exceedingly tasteful and ornamental. It will be found very useful by steam and hot water fitters in making selections of radiators.

"New" Standard Radiators.

The accompanying illustrations show general views of two radiators lately brought out by the Standard Radiator



"New" Standard Radiators.—Fig. 1.—Regular Pattern.

Company, Buffalo, N. Y. Fig. 1 illustrates the "New" Standard radiator of regular loop. The appearance is indicated in the engraving, the radiator being a handsome article of neat and graceful form and pleasing decoration. These radiators are built in various sizes from 2 to 32 sections, and in six hights, from 18 to 44 inches high. The 32-inch loop of two sections has 9 square feet. Each section is 9 inches over all and hight from center of opening to floor is 5 inches. The manufacturers also furnish special hight leg sections, and tappings ranging from 4 to 10 inches from center of opening to floor, as required. These radiators are made for both steam and hot water.

Fig. 2 is a perspective view of the "New" Standard radiator single loop, which are made in sizes from 2 to 32 sections, six hights from 18 to 44 inches, the surface of two-section radiator of 32 inches hight being 5 square feet. Each section is 5½ inches over all, and hight from center of opening to floor is 5 inches. As in the case of the regular pattern, special hight leg sections can be furnished if desired. The manufacturers particularly point out that these radiators have top and bottom connection, which they say insures rapid and

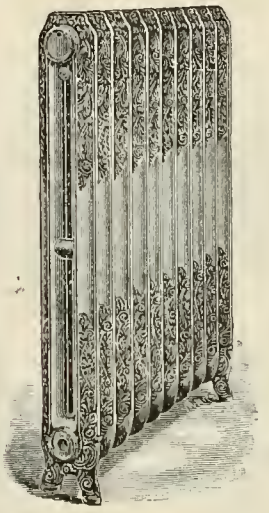
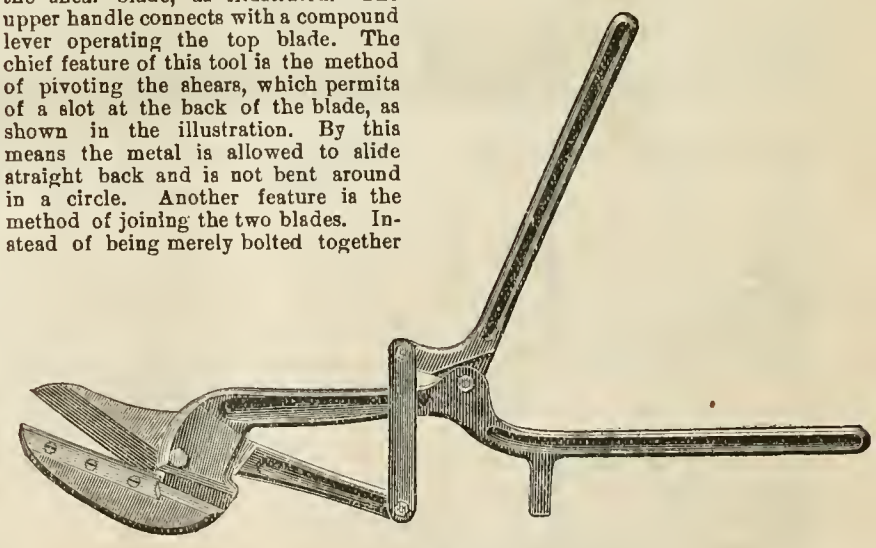


Fig. 2.—Single Loop.

positive circulation. They mention that they have decided to make all their radiators in this way, as they are firmly convinced of its superiority.

The Lobl Sheet Metal Shears.

We show in the accompanying illustration a general view of the Lobl sheet metal shears, manufactured by Eugene Kulinski & Co., 91–93 Thompson street, New York. Referring to the illustration, it will be seen that the lower shear is a single piece, to which is attached the shear blade, as illustrated. The upper handle connects with a compound lever operating the top blade. The chief feature of this tool is the method of pivoting the shears, which permits of a slot at the back of the blade, as shown in the illustration. By this means the metal is allowed to slide straight back and is not bent around in a circle. Another feature is the method of joining the two blades. Instead of being merely bolted together



The Lobl Sheet Metal Shears.

the main joint runs in a turned socket, which, it is pointed out, takes the strain off the screw. The compound lever, of course, gives great power to the shears. The shears are made of cast steel, the jaws being of hardened Carpenter & Jessop steel, and it is mentioned are easily replaced. The upper jaw is rounded so as to reduce the cutting point to a minimum. The No. 3 shears are 36 inches long with 6½-inch jaws, weigh 20 pounds, and will cut metal as heavy as No. 10 brass and No. 12 iron.

Australian Tin.

Australia, as is well known, is one of the tin bearing countries, from which supplies of the metal find their way to the United States. The principal stanniferous deposits of that country are found in the colony of New South Wales, where they were discovered as far back as 1853. It was not, however, until 1872 that they began to be systematically worked. From recent statistics of the mineral production of New South Wales, furnished by the Colonial Department of Mines, the quantity of tin raised and exported during the 21 years ending December 31, 1892, was 121,912 tons, valued at $31,236,368. This includes tin in the shape both of ore and of ingots. The *Iron and Steel Trades Journal* of London observes that the production of the metal is now one of the settled industries of the country, and, as the supply is practically unlimited, the quantity raised depends almost entirely upon the price realized. There are no tin manufacturers in New South Wales, and although the mineral is so plentiful in the colony, the whole of the manufactured tin used for canning meat and fruit and other purposes has to be imported. The quantity of tin plates so imported during 1892 amounted to 62,078 packages, of the estimated value of $237,875. There were also 19,033 packages of tinware, valued at $80,613. Practically the supply of tin in the colony is inexhaustible. Up to the present time the deep deposits and lodes have scarcely been touched, the bulk of the metal obtained being in the form of stream tin.

The latest addition to the American Line's transatlantic fleet is the "Kensington," which made a most successful trial trip on the Clyde last week. The vessel was built by J. & G. Thompson of Clydebank, Scotland, the builders of the "New York" and "Paris." She is 480 feet long, 57 feet beam and 40 feet deep, with gross tonnage of 10,500 tons, and a measured cargo capacity of 11,500 tons. The "Kensington" is fitted with quadruple expansion engines of 8000 horse-power, and is expected to attain a working speed of 15 knots per hour. While primarily a cargo and steerage steamship she will have accommodations for 200 cabin passengers.

PLUMBING and GAS FITTING.

William C. Macdonald.

The plumbing trade will learn with regret of the death of William C. Macdonald, who was drowned in the Passaic River, near Nutley, N. J., while heroically endeavoring to save the life of a young lady who had fallen from his naphtha launch, "The Martha," last Saturday afternoon. Mr. Macdonald was a member of the plumbing firm of Macdonald & Co., 296 Sixth avenue, New York, being associated with Alexander Bryant and W. J. Crow. Mr. Macdonald is a son of the late Joseph A. Macdonald, who organized the firm in 1861, and who was well known to the plumbing trade, having been identified with the great progress which it has made during the past ten years, serving as president of the New York Association of Master Plumbers as well as president of the National Association of Master Plumbers. The young man was 22 years of age, and his death was a severe blow to his mother and two brothers, who live at the Chelsea apartment house in New York.

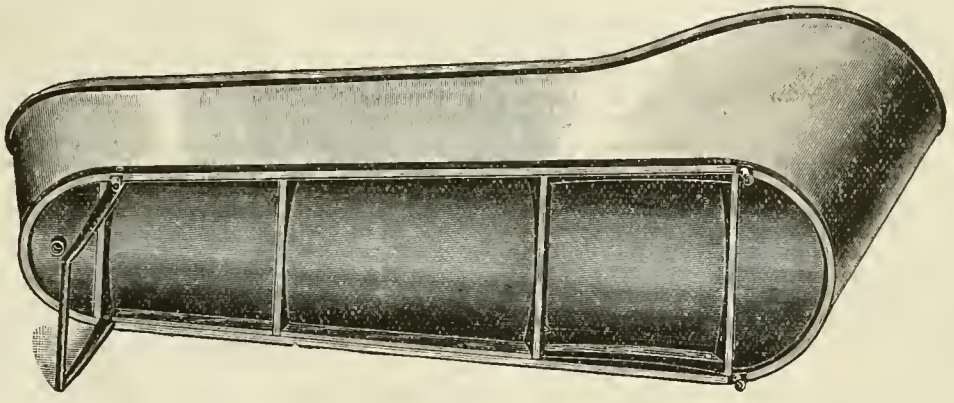
A Worthy Plumber.

The following letter to a Bridgeport, Conn., daily paper from Daniel G. Finnerty, president of the National Association of Master Plumbers, expresses the opinion held by all of Mr. Goodsell's friends:

I notice in your issue of May 21 the New York *Tribune* sneers at the proposition of elevating a common plumber to the high station of Governor of your State. I should like very much for the New York *Tribune* to send one of its representatives to one of the Master Plumbers' State or National conventions that he might see and learn that the plumbers of the United States compare favorably with any class of business men, both in ability and integrity, for the welfare of the citizens and public at large. There can be found men among the plumbers who are competent and capable, not only to fulfill the high position of Governor, but also any office in the gift of the people, and Zalmon Goodsell is one of those men, and whom I have had the pleasure of knowing for a number of years, and the citizens of Connecticut would be the gainers by electing a thorough business man to the very important position of Governor. Therefore let your citizens nominate and elect Zalmon Goodsell Governor of your State and the citizens will have a man who will administer its affairs with both intelligence and honesty and in a business-like manner, and that is what is wanted by all good citizens. Hundreds of business friends of Mr. Goodsell throughout the country know full well that if elected Governor the people of Connecticut will never regret that they cast their votes for the Bridgeport master plumber.

Economy Bathing Tub.

The accompanying illustration shows a general view of the Economy bathing tub, manufactured by Forest Druken brod, New Berlin, Ohio. It is a portable bathtub, made of zinc, with top and bottom rims of well seasoned bent hardwood. The advantages of this form of bathtub are alluded to by the manufacturer. The tub can be transported wherever it is desired to have it, and when not in use can be hung against the wall or placed in a vacant corner or closet. It has plug and chain attachment, the waste being at the lower end, as shown in the illustration. The bottom is concave or rounding, so that it does away with the necessity of much water and at the same time fits the body. The tub can be elevated at the foot end so as to raise the level of the water and completely cover the body. It is painted on the outside and enameled within.



Economy Bathing Tub.

A NOVEL METHOD of bringing an apparatus that is very essential in high buildings in the large cities to the notice of the public is adopted by the National Meter Company, 287 Broadway, New York. An attractively painted open wagon bearing their name and address, with the words, "Water Meters and Gas Engines," is being driven around the city, stopping occasionally at different points on the streets, which shows a Nash pump operated by a gas engine adapted for the use of gasoline. The pump is connected with a tank about 3½ feet in diameter and the same hight, and in operation a steady stream of water is continually thrown into the tank by the pump. The tank bears the lettering: "Capacity, 750 gallons per hour to a hight of 50 feet."

Trade School Exhibits at the Pratt Institute.

The annual exhibition of the work of the students during the academical year 1893–94 was held at the Pratt Institute, Brooklyn, on May 31 and June 1 and 2. Among the most interesting exhibits were those of the Trade School classes of the institute, which included plumbing, carpentry, house, sign and fresco painting and machine work. Each department made a remarkably creditable showing, and none more so than the plumbing class. The work of the pupils of the class—about 50 in number—was displayed in their own class room. Specimens of the handiwork of each student being attached to the wall opposite his particular bench. On one side of a large show board in the center of the room was a complete system of piping for a kitchen boiler connection and lavatory. The other side displayed a fine collection of fancy plumbing work, all being the work of the pupils. In addition, two handsome panel specimens, the work of the 1892–93 class, were on exhibition. These panels formed part of the Pratt Institute educational exhibit at the World's Fair.

The examples of the skill and efficiency of the pupils of the plumbing class drew for the same hearty words of commendation from the visiting plumbers who viewed them. They reflect great credit on Instructors Todd and Heath, under whose management and care the necessary knowledge has been imparted. A marked feature of the present year's exhibition was the lively interest shown in it by the various trade associations. Large delegations of artisans attended and carefully inspected the work on view.

Already many applications have been received from young tradesmen desirous of joining next season's plumbing class, and it is expected that, as usual, the candidates for instruction will far exceed the accommodation. The managers of the Trade School take a pardonable pride in the unqualified success of the institution, which is progressing annually to greater importance and usefulness.

Missouri Master Plumbers.

The following was sent by State President L. B. Cross, 1212 Main street, Kansas City, Mo., under date of June 1 to the plumbers of Missouri:

The Missouri State Association of Master Plumbers will meet in St. Louis on Friday, June 15, at 10.30 a.m., at the hall of the St. Louis Master Plumbers' Association, Hagan Building, S. E. corner Tenth and Pine streets. The object of the meeting is the election of delegates to the National Convention in Detroit, on June 19, and for the transaction of such other business as may come before the meeting. We congratulate our brother plumbers on the good spirit and unanimity shown since the organization of the State Association in Kansas City last December, and we hope to see every city and town in our State represented at this meeting. Delegates on arriving will please immediately report themselves at the headquarters, Lindell Hotel, Sixth street and Washington avenue, where the Reception Committee will be in continual session o tender them a cordial and hearty welcome.

TRAPS AND VENTS.

A. S. Chipman of the firm of A. S. Chipman & Co., manufacturers' agents and dealers in plumbers' supplies at 69 Pearl street, Boston, was married to Miss Nellie Jubell of Winooski, Vt., on Wednesday evening, May 31. After a tour the couple will settle down in Wellington, Mass.

John Shine, plumber, has moved his material from Elm street to the building in the rear of the Trenton National Bank, Trenton, Mo.

G. A. Stanfield, who for the past two and one-half years has been in the employ of the Marietta Plumbing Company, Marietta, Ohio, has established himself in the plumbing and gas fitting business at 411 Second street.

George M. O'Connor, 156 Fulton avenue, Long Island City, N. Y., has just started in the plumbing business.

Robert Handyside has purchased the plumbing business formerly conducted by A. Handyside at 120 Worthington street, Springfield, Mass.

T. C. Waters, who has been in the plumbing business at Shenandoah, Pa., for the last 22 years, has opened a store at Pleasantville, Pa., or Eureka post office, as it is called, where he will carry on plumbing, tinsmithing and also carry a full line of stoves, heaters, &c.

Isaac H. Voorhis has succeeded his brother, the late Garret D. Voorhis, in the stove and plumbing business, at 11 Fair street, Paterson, N. J.

A Washington (D. C.) plumber has been brought before a justice for violating the plumbing regulations, having pursued his occupation without a license.

W. E. Everitt, 336 Hamburg street, Buffalo, N. Y., is using in the city of Buffalo a machine for boring holes through the earth under street pavements for tapping water and gas mains without disturbing the pavement. The local plumbers, it is reported, have witnessed its operation and are pleased with the result.

Some of the plumbers of Omaha, Neb., were recently brought before the Board of Public Works and admonished that if they did not cease to transgress the rules of the Board their licenses would be revoked. Some of the plumbers in the city have chosen to run the risk of doing business without a license, and when their work required a permit this portion of it was sublet to a licensed plumber. The board has decided that such practice is illegal and has served notice that the next time a licensed plumber is found doing such work his license would be revoked.

The City Council of Pueblo, Col., have revised one of the clauses of their plumbing ordinances as follows: "No person shall carry on or contract the business of plumbing or drain laying or engage in the business of plumbing or house drainage or connect house drains with city sewerage until he or they shall have first obtained a license from the city clerk; provided, no license shall be granted any applicant or applicants until he or they shall first have given the plumbing inspector, city engineer or Sewer Committee satisfactory oral or documentary evidence of their ability as a practical plumber or plumbers or drain layers, and they shall have a regularly established plumbing business and place of business in the city. They shall have a properly executed bond in the sum of $1000, and pay an annual license fee of $10."

The Davis Creswell Mfg. Company of Denver, Col., met with a serious loss on the 28th ult. in the almost complete destruction by fire of their foundry and machine shop, used in the manufacture of plumbers' and steam fitters' supplies.

H. E. McKechney, formerly of Rochester, N. Y., has opened a plumbing shop in the Waverly Block, Newark, N. Y., as his headquarters for plumbing, steam and hot water heating.

The Smith & Anthony Company of Boston, New York and Chicago have issued a circular announcing that on June 1, 1894, they transferred the plumbing specialty business carried on in their name at 217 Lake street, Chicago, to the Alberene Stone Company, who will act as Western agents for the Sanitas plumbing appliances. They state that the wide acquaintance and popularity of the Alberene Stone Company are guarantees that their patrons will receive prompt and satisfactory service in all future dealings. J. A. Cunningham, Jr., who has been their Western manager for the past four years, becomes associated with the Alberene Stone Company in a responsible capacity, and with the added facilities at his disposal will be able to represent the Sanitas specialties more acceptably to the trade than ever before. The Alberene Stone Company notify the trade that, having assumed the agency in Chicago for the sale of the plumbing specialties manufactured by the Sanitas Mfg. Company, they have removed their office and warerooms to 217 Lake street, where they will continue to sell their Alberene stone specialties in connection with the Sanitas appliances. C. C. Todd retains the management.

The monthly report of the Building Inspector of Cincinnati, Ohio, will show that during the last month 163 plumbing permits were issued. This is the largest number in the history of the office for that period.

James Gray, plumber and manufacturer of plumbers' specialties, East Albany, N. Y., took a steamer this week for a trip abroad. He will visit England, Ireland and Scotland and will make a short trip on the Continent.

The Chicago Plumbers' Arrangements.

The Chicago Master Plumbers are arranging for a pleasant excursion to Detroit on the occasion of the approaching national convention. They have issued the following circular:

Chicago, Ill., June 5, 1894.

To Delegates and Members of the Master Plumbers' Association who will attend the Twelfth Annual National Convention, to be held at Detroit, Mich., June 19–21, 1894:

The Chicago Master Plumbers' delegates, alternates and members have arranged their transportation to Detroit and return via the Wabash Railroad. A special train has been chartered and will leave Chicago at 10 a.m., June 18, from depot, Dearborn station, and arrive at Detroit not later than 5 30 p.m. Train will consist of the following first-class vestibuled equipment: Baggage car, with commissary, ladies' coach and Wagner palace sleeping cars and private dining car, which will be stocked with the choicest delicacies of the season. The cost of the railroad ticket in the Central Traffic Association will be one and one-third fare for the round trip—namely, when purchasing your ticket request certificate of railroad agents, which certificate, when signed by the secretary of the Master Plumbers' National Association, at Detroit, will entitle you to return to starting point in the Central Traffic Association at one-third the regular one way rate. The fare from Chicago to Detroit, one way, is $7.75.

The round trip on this plan will be $10.35. Dinner in dining car will be only $1. The committee have chartered the very best Wagner sleeping cars in special service, direct from the Wagner Sleeping Car Company. Seats in the sleepers can be had on the train at a minimum of expense. The Committee of Arrangements have carefully considered the question of comfort and economy, and trust their efforts, which have been directed toward the immediate benefit of the members, will be appreciated.

An invitation is hereby extended to all delegates, alternates, members and their families, who can arrange conveniently to come via Chicago, to join our special train party. The trip will be a delightful one. Up to the present time the Western Passenger Association have failed to give reduced rates in their territory. We are hopeful, however, of securing some reduction for any who may apply to us, from points tributary to Chicago. The committee would like to hear from all who have in contemplation the trip to Detroit, so that ample accommodations can be provided and unnecessary crowding of special train be avoided. Tickets and certificates can be had on application to undersigned,

or ticket offices of Wabash Railroad, 201 Clark street, Chicago, at depot office and also on the special train.

PAUL REDIESKE, President.
ALEX. M. MURRAY, Secretary.

J. G. ROLAND, Ch.,
P. M. MURPHY,
T. P. CULLOTON,
P. SANDERS,
} Transportation Committee.

HEATING ⁂ PLUMBING.

NEW WORK AND CONTRACTS.

HUNT & CONNELL COMPANY, Scranton, Pa., have contract for placing a No. 310 Low Down steam and air combination in the residence of Geo. Hughes of Luzerne, Pa. The same firm also have contract for placing a No. 218 Economy steam boiler in the building owned by James Hughes of Luzerne, Pa.

DAVID HORN, of York, Pa., has contract for installing one Economy combination steam and air heater in the residence of David Strickler of that town.

THE CONTRACT for the heating apparatus for the new Industrial School at Newport, R. I., has been awarded to Philip F. Conroy.

AT THE LAST MEETING of the Executive Committee of the Board of Trustees of the Winthrop Normal and Industrial College, Rock Hill, S. C., the following contracts were given out: For heating apparatus to main building and one dormitory, to Hunnicutt & Bellingrath, Atlanta, Ga., plant to cost $10,000; for slate roof for main building, one dormitory, kitchen and heating plant, to Jones & Co., Atlanta, Ga., price $6300.

THE S. WILKS MFG. COMPANY, 113 to 123 Clinton street, Chicago, are to furnish a large heater for the residence of Mr. Cleveland, Englewood; a large heater and tank for the apartment building of H. Konoke, Dunning and Sheffield streets; Wilks heater and radiator for heating and supplying hot water for the depot of Swift & Co., Port Huron, Mich.; heater for greenhouse at Stillwell, Mich. The company have also received orders for their heaters from Macon, Mo., Romeo, Mich., and other points.

EVERY ONE RECOGNIZES the supreme importance of first-class plumbing, says a writer in one of the Boston dailies, speaking of their recently completed $3,000,000 court house. The plumbing work in this building was installed bp George A. Wilson of 73 Esaex street. The fixtures include 215 water closets, 75 lavatories and 60 urinals. The latest and most improved materials were used throughout in fitting it up. The hot and cold water pipes are of extra heavy brass. This plumbing contract was one of the largest ever given in New England. The heating of the building was designed by Bartlett, Hayward & Co., Baltimore, and the contract, which amounted to $125,000, was awarded to Samuel I. Pope & Co. of Chicago. The work of installation was supervised by J. E. Lynch, now of the firm of Lynch & Woodward, of 26 Beech street, Boston.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until June 29, for work including the plumbing for the United States Post Office, Custom House, &c., Building at Jacksonville, Fla.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until June 30, for a low pressure return steam heating and ventilating apparatus for the United States Court House and Post Office Building at Tallahassee, Fla.

THE BOARD OF SUPERVISORS of Schuyler County, N. Y., met at Watkins last Saturday to award the contracts for the repairs to the county buildings. The contract for the steam heating and plumbing was awarded to R. H. Walker of Elmira, N. Y., for $2857.

HIGGINS & Co, 379 Lexington avenue, New York, have the contract for heating a four-story stone dwelling at 310 West Eighty-ninth street, using a No. 124 Richmond hot water heater; also a hotel, 270 Bowery, owned by Gary & Lowless, using a No. 313 Richmond hot water heater.

JAMES A. TRANE, La Crosse, Wis., has been awarded the contract for furnishing the heating apparatus for the new addition to the Logan Street School.

THE SCHOOL BOARD OF INDIANAPOLIS, IND., have passed an appropriation of $1800 for the repairs to the heating boilers and construction of new flues in School No. 2.

AMONG THE CONTRACTS taken recently for steam heating by Cook & Chick, 253 and 255 Kinzie street, Chicago, can be mentioned the following: Store and apartment building of Hynes Bros., 3641 and 3643 State street, and the store and apartment building of Lewis Bates, 3637 and 3639 same street.

MRS. A. J. NYE is having placed in her frame dwelling a No. 418 Richmond steam heater, by C. B. Jackman & Son, Nashua, N. H., who are also installing Richmond hot water heaters in the residences of George B. and D. J. Cone.

THE THEO. JACOBS COMPANY, 72 and 74 Market street, Chicago, have secured the contract for steam heating in the Marquette Building, Dearborn and Adams streets. There will be 50,000 feet of the American Radiator Company's radiators used in the building.

KEHM & MERTZ, 289 East Kinzie street, Chicago, are to install a steam heating plant in the residence of C. E. Kohle, 2826 Michigan avenue.

THE WELLS & NEWTON COMPANY, 274 Dearborn street, Chicago, are to install a steam heating plant in the Wellington Apartment Building, Thirty-fifth street and Wabash avenue.

THE KELLY & JONES COMPANY, 48 to 52 North Clinton street, Chicago, have the contract for steam heating in the Winston Apartment Building, East Superior street.

MARVIN & DEBOOY of Orange City, Iowa, are using a No. 121 Richmond hot water heater to heat the dwelling owned by Charles Lewis of that city.

THE WALCOTT-HURLBUT COMPANY, 175 and 177 Lake street, Chicago are to furnish two Siphon Eduction closet ranges of seven sections each for the Crain Street School at Evanston, Ill.

THE WELLS & NEWTON COMPANY, 274 Dearborn street, Chicago, have the contracts for plumbing in the Marquette Building, Adams and Dearborn streets; residence of C. E. Johnston, 4442 Forestville avenue, and are to overhaul the plumbing in the residence of C. E. Kohle, 2826 Michigan avenue.

RICHMOND STEAM AND HOT WATER HEATERS are being used in heating contracts secured by J. H. Cogan & Co., Augusta, Maine, for the residence of the Hon. Benj. F. Parrot. At Boston Isaac Coffin & Co. are using them in the residences of C. A. Pierce, C. W. Mason and N. E. Chase. At Lowell, Mass., the H. R. Barker Mfg. Company are using one in the residence of Willard A. Brown, and F. A. Bates has the contract to use one in the Lyceum Building, at Braintree, Mass.

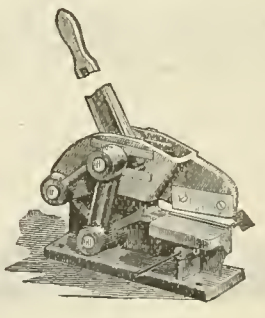
BIDS will be received up to June 24 for furnishing hot air furnace to heat the school building at Milford, Ohio. The bids should be addressed to Dr. Con. Gatch and should be inclosed in an envelope marked "Bids for furnace."

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until July 6, for steam heating and ventilating apparatus for the United States Post Office Building, Fort Dodge, Iowa Drawings and specifications may be obtained at the office of the superintendent at Fort Dodge, or from the Supervising Architect at Washington.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until July 3, for the hot water heating and ventilating apparatus for the United States Post Office Building, Lowell, Mass. Drawings and specifications may be obtained at the office of the superintendent at Lowell or from the Supervising Architect at Washington.

Core Rod Cutter and Shear.

The engraving represents a tool designed by the S. Obermayer Company of Cincinnati, Ohio, for the foundry core room or where a miscellaneous amount of cutting off and light shearing is done. It will cut round iron up to ⅝ inch in diameter, and with the gauge attached, which can be set to any



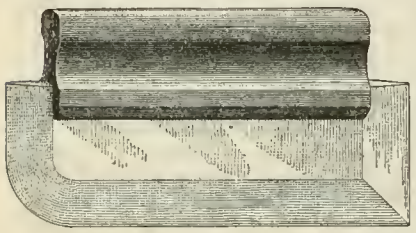
Core Rod Cutter and Shear.

length up to 15 inches, rapid work is possible. The shears are of tool steel 4 inches in length and can be readily removed for sharpening. The handle is of malleable iron 15 inches long. By reference to the engraving it will be seen that the rear ends of the two jaws are pivoted together, the upper jaw being slotted to admit the other. The two jaws are also connected by links whose lower ends are pivoted to the lower jaw and whose upper ends are provided with studs entering guides formed in the upper jaw, as shown. This arrangement gives great lever power and permits of the cutting of large pieces, considering the size of the machine, which weighs but 35 pounds.

THE RETAIL STORE.

The Boosinger Scraper.

Harris E. Thomas, Lansing, Mich., is offering the scraper herewith shown. It consists of a heavy piece of rubber 4½ inches long and 1¾ inches wide, with beveled edges, set in a wooden handle. The device is particularly adapted to scraping off dining room dishes of all shapes. The point is made that with the scraper this is done much quicker and neater



The Boosinger Scraper.

than with a knife, and that all danger of marring or scratching the finest of china or silver is obviated. It is explained that the rubber blade being thick, with beveled edges, it will not roll under, but clings to the dish, and so effectually cleans even one of irregular surface that little more than a thorough rinsing in water is required to make it perfectly clean. The scraper may be used for drying windows or other smooth surfaces; also for cleaning fry pans, kettles, pudding dishes, basins, &c., preparatory to washing them.

Ladder Skate.

Specialty Mfg. Company, Titusville, Pa., are offering a ladder skate, as here shown. The bottom of the skate is

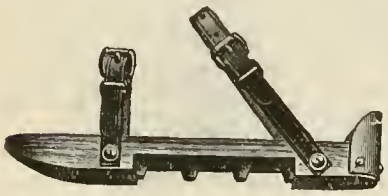


Fig. 1.—Ladder Skate.

provided with a three-loop casting to prevent slipping on the round of a ladder. The manufacturers state that the skates can be put on or taken off in an instant; that they do not have to be

Fig. 2.—Bottom of Ladder Skate.

taken off when walking on the ground; that by their use standing on the round of a ladder is made as comfortable as standing on the ground, and that the skates are so made that the foot can be moved on a ladder to any desired position. The skates are designed for the use of tinners, painters, fruit growers and others who use ladders. The point is made that the skates are great savers of shoes.

Double Tank Thermometer Churn.

R. M. Ball, Muncie, Ind., is offering the double tank churn shown in the accompanying illustrations. The churn consists of a vertical dasher with a rotary reciprocating motion and two detachable cylindrical tanks, one of

Fig. 1.—Double Tank Thermometer Churn.

heavy cross tin inserted inside of and resting with its upper rim or flange upon the wooden tank, the inner one of which forms the cream containing vessel, as shown in Fig. 2. The space between the tanks is filled with water, allowing the operator to control the temperature of the cream by pouring either hot or cold water into the tube

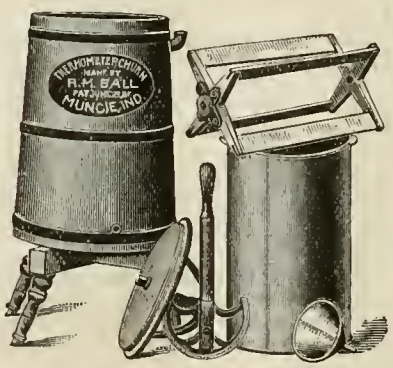


Fig. 2.—Parts of Double Tank Churn.

near the top of the outer tank by the aid of the funnel. Thus the temperature of the cream can be changed in a moment without adulterating it with water. The churn has an indicator in the cover to enable the operator to tell when butter comes, and also to give perfect ventilation. The manufacturer claims that with the churn butter can be made out of any cream, sweet or sour, in from 2 to 20 minutes; that the churn is easily taken apart and cleaned; that there is nothing about it to wear out or to get out of repair: that 1 quart of cream can be churned as well as 4 gallons, and that there is no slopping or dripping of the cream.

The Peerless No. 2 Telephone Outfit.

Robert H. Ingersoll & Brothers, 65 Cortlandt street, New York, are offering the telephone outfit as here shown The parts illustrated in Fig. 1, and the battery in Fig. 3, are furnished in duplicate, providing a call bell, receiver-transmitter, and battery at each end of the line. The receiver transmitter,

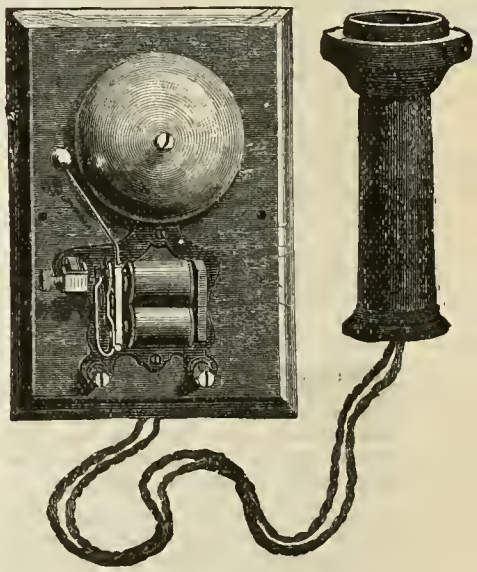


Fig. 1.—Call Bell and Receiver-Transmitter.

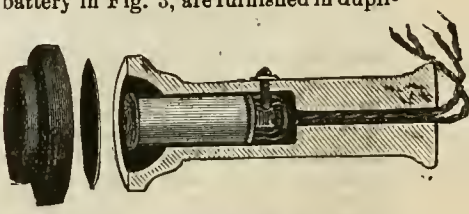


Fig. 2.—Receiver-Transmitter in Detail.

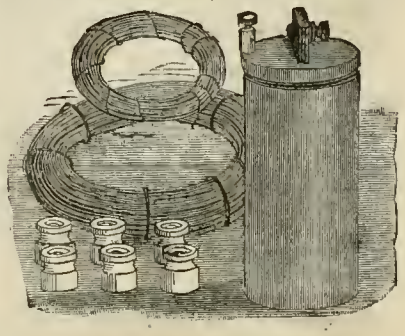


Fig. 3.—Battery and Accessories.

Fig. 2, is a combined instrument which is alternately placed to the mouth to deliver the message, and then to the ear

to receive the answer. It is stated that this will carry sound with the same distinctness on all lines of any length. The call bell, Fig. 1, ordinarily furnished with the outfit is constructed to ring for a distance of 1 mile and under. Bells of greater capability are furnished with outfits for long distances. The bell is mounted on a polished hardwood backboard, from which the receiver-transmitter is suspended by a telephone cord. At the back of the board, concealed from view, are the switches and connections, which are automatically operated by two push buttons at the side of the board, one to ring up and the other to connect the phone with the line wire and battery. The outfit here represented is sold at $7.50, and is guaranteed by the makers to work perfectly over 1500 feet of No. 18 copper or No. 10 iron wire. By adding a battery to each end—making two batteries at each end of the line—the outfit will work to half a mile, and by the addition of another battery to each end it is made to work up to 1 mile. If proper calculation is made in ordering, enough wire, &c., may be shipped to cover all requirements. The manufacturers suggest that where distance will add largely to the cost of shipping the batteries be bought near at hand, if good batteries can be so secured.

Electrical Goods in the Hardware Store.

BY W. P. STEWART.

In considering the advisability of handling Electrical Goods in connection with the Hardware business, the first question is, Does it pay? The experience of the writer is that it does pay in more ways than one.

In the first place, there is a good percentage of profit on the amount invested; in fact, as good as on any line of special or fancy goods usually handled.

In the next place, it evinces the spirit of enterprise and progress that should obtain in every modern Hardware establishment, and shows that it is up with the times.

NO ONE QUESTIONS

the value of this reputation in a business house. Energy, a complete stock and a comprehensive knowledge of the business are sometimes more profitable in the long run than cutting prices.

Provided the stock is not too large and varied, the labor attendant upon handling Electrical Goods is imperceptible, and is not worth considering in the discussion. As to space required, a case less than 3 feet square or a small wall space is ample to display as large a variety of Electrical Goods as it is desirable for a retail house to handle. Several of the manufacturers in this line have prepared at moderate cost just such

A DISPLAY BOARD

as is desirable. Electricity is something understood by few, but of interest to all, and such a display always attracts attention. Many persons who perhaps had no idea of purchasing anything of the sort, or, if they had thought of it, were deterred by the impression that such things cost a great deal, upon learning that, say, $3 or less would pay for a complete electric bell outfit they will invest.

The remark is often made that such things will do for people of means. In point of fact it is to persons of moderate means and with few servants that such conveniences are of the greatest value, while the amount of bother avoided by the use of a simple system of electric bells and speaking tubes has to be known to be appreciated. Of course electrical goods will not

SELL THEMSELVES

any more than other goods will, so it rests with the salesman to appropriately and in a pleasing and interesting manner call attention to the desirability of such appliances. It is not necessary that he be an electrician in even a very limited sense of the term, although some knowledge of the subject is of value, and can be very easily acquired in this electrical age.

It is of great importance in offering such goods not to claim too much. Do not let the desire to make a sale lead you to convey the impression that there is no danger of a bell getting out of order, or of a battery getting weak or giving out. Such things will happen, and it is well to call attention to the fact that the necessary material for maintenance can be easily and cheaply procured.

DIRECTIONS

frequently accompany the outfits furnished by manufacturers, and any person of average intelligence can put them in operation.

In regard to installation, if there is an available man in the house who can be intrusted with the work it would add to the profits, but except in large cities it would hardly pay to keep a man for such work alone. In every community, however small, there is generally some handy man who can do such jobs for a moderate consideration. There are two technical points which it will not be out of place to mention in this connection, a neglect of which has given more trouble than anything else in ordinary domestic work. These are neglect in

SPLICING AND TACKING

up wires. Insist upon long, clean bright and tightly twisted splices, covered with insulating tape, and never under any circumstances let one staple or tack be driven over two wires. Good outfits have often worked for months and then refused to respond to the strongest battery power simply because corrosion had ruined a loose or uncovered splice, or crossed a current where one tack held two wires. Sometimes plastering has to be torn out to get at such work or new wires run outside. Such carelessness does much to hurt the sale of electrical appliances.

In the opinion of the writer the Hardware dealer who can in a moderate way handle these goods to advantage will do well to confine himself to

DOMESTIC APPLIANCES,

which may almost be classed as House Furnishing Goods. The heavier articles in this line, such as are used by street railways and electric lighting stations, can be left to houses which handle such goods exclusively. Call Bells in sets, ready packed and complete, are the best sellers. These can be had with various styles of Bells and pushes or pulls. A neat and familiar device, and one which appeals strongly to every lady, is the floor push to be used under the dining table for communicating with the kitchen. A simple code of signals makes this a great convenience.

The ordinary annunciator, for indicating the source of the call, is a familiar appliance, and is so moderate in price that it can be advantageously handled. A careful examination of the catalogues of several large manufacturers in this line would convey very clear ideas of the many domestic uses to which this great servant of man can be applied.

One of the simplest methods of illustrating the operation of ordinary Bells is to have a push button at the front part of a store and a Bell at the rear or some distance away. This conveys a much better idea of its uses than when the button and bell are both attached to the same small box.

A small stock is all that is needed, as it is so easy in these days of rapid transportation to replenish.

A GOOD ASSORTMENT,

although perhaps not complete, would include the following:

One-half dozen assorted Bell Sets in boxes.

One-half dozen assorted Box Bells, 2½ to 4 inches.

One-half dozen extra Cells Leclanche or other good battery of the same class.

One dozen assorted Wood Pushes.

One dining room Floor Push.

One Floor Push with 6 feet of extension cord and Push for table.

One Circuit Closer to use in connection with an old style door bell pull.

Two dozen extra Zincs.

Two dozen bags Sal Ammoniac.

Ten pounds No. 20 Annunciator Wire.

One two-point Annunciator.

One four-point Annunciator.

One pound package ½-inch Adhesive Tape.

One bronze Door Pull.

One 24-inch bell hanger's Gimlet.

Burglar alarms and gas lighting may be attempted, but as they require a greater amount of labor and technical knowledge, and are more liable to get out of order, had perhaps better be omitted by the average Hardware man.

MEMORANDA.

THE SHOW WINDOW of the hardware store of Weber & Brother, 2209-2211 North Front street, Philadelphia, Pa., is one of more than ordinary beauty and attractiveness, it not being too crowded with display material, and that which is displayed is arranged with excellent taste. The window has another feature which will be more than ordinarily interesting, in that the cutlery and polished steel goods shown have been on display since the window was trimmed for last Christmas, and yet show no marks of tarnishing or dust. The window is made practically air tight, the doors shutting against felt and secured by a tight drawing refrigerator door latch. This window occupies the center of the front and is very wide. Doors enter the store on each side of it and smaller windows are at the sides of both of the doors. These windows show attractive seasonable articles in the house furnishing line.

ON JUNE 1 Louis S. Coe retired from the firm of Edward P. Haff & Co. of this city, manufacturers of Hardware specialties, and will continue in the same business as president of a corporation styled Coe Mfg. Company, 98 Duane street, New York. This concern will manufacture a complete line of specialties in Cork Screws, Tape Measures, Tweezers, Key Chains, Hair Curlers, &c., as well as a large assortment of House Furnishing Hardware. Mr. Coe, who is well known to the Hardware and specialty trade in this city and vicinity, is preparing to bring out a number of useful and attractive articles for the fall trade.

The County Council of London, England, has ordered that all signboards be made of metal, much to the disgust of the carpenters.

STOVE TRADE NOTES.

The Chicago Stove Trade.

The Chicago stove houses are not overrun with business at present. It is usually dull at this time, however, being between seasons. The spring trade is over and fall trade has hardly opened up. Travelers are out pretty generally, but have thus far covered only a small portion of their territory. Here and there some fairly prosperous localities have been struck and satisfactory orders obtained, but between them too often intervenes a wide gap. While manufacturers would like to see a much larger trade in progress, it is a question whether they would not still more increase their anxiety over the probable outcome. As general business conditions are enforcing economy among the people, retail merchants must necessarily be careful in laying in stocks of any kind of goods. But if they were to purchase stoves heavily, in apparent defiance of a day of reckoning, there would be a much closer scrutiny of credits and orders would perhaps be curtailed at the factory end. It is better for stoves to move slowly from warehouses and be paid for promptly than to be rushed into merchants' hands and finally settled for on the basis of so many cents per dollar. Under existing conditions, therefore, business is about as good as can or should be expected.

In reviewing the spring trade, one is struck with a rather remarkable fact. It would be supposed that high grade goods would suffer more seriously than cheaper ones, with the known curtailment in the purchasing power of the people. While this has been the experience of some manufacturers, it was by no means general. Many of them report a less per cent. of shrinkage on their business in first-class ranges, for instance, than in cheap ranges and cooks. Certain styles are growing in favor, notwithstandsng their higher price, and the smaller falling off in their sales indicates a positive gain, which will, of course, show up handsomely when times improve and the masses can again consult their tastes without such close reference to their pocketbooks. They are being educated to the use of better articles in their kitchens as well as neater furniture in their parlors; and as a stove or range is expected to last a great many years, the additional price for a high grade stove is not a serious matter if the time has come when one must be bought.

This naturally brings up the question of prices. No weakness in price has yet developed among manufacturers. They state that their customers are making no demand for better rates. If they wish to buy stoves they are apparently satisfied to pay the price asked when assured that it is an unvarying price to all. Merchants as well as manufacturers realize that no more stoves would be sold even if the price were cut in two, and as long as prices are fair and not so high as to be prohibitory they are not disposed to press vigorously for a reduction. The action taken by the manufacturers at their recent convention thus seems to be well sustained. It would be very unwise to abandon such a conservative policy in the hope of increasing business. Demoralization would inevitably ensue and merchants would reap no benefit from it, while manufacturers would be greatly injured.

Looking to the future, ground for considerable encouragement can be seen. Last year witnessed the culmination of a series of depressing influences such as this country never before experienced. As "the mill can never grind again with the water that has passed," so business cannot again suffer from the misfortunes it has once passed through. The panic is over, the currency question has been settled, liquidation has run its course, the banks are loaded with money and the work of relaying the foundations of business prosperity is well under way. Labor troubles are disturbing us at present to some extent, but they must soon be ended in the nature of things. The number of persons finding employment will continue to increase. From this time forth we may expect to show a steady advance in the direction of better trade and an enlarged spirit of enterprise among the people. Orders for stoves placed during the next two or three months will not be canceled as they were last year, but will be duly filled and more stoves will be ordered after they are sold.

ADVICES from Sioux City, Iowa, indicate that slight hopes exist of the resumption of business by the Sioux City Stove Works, whose plant is in the manufacturing suburb of Leeds. An attempt is being made to locate a number of small manufacturing establishments from other points in the buildings formerly used by the stove works. Should this be accomplished it will of course settle the future of the plant with regard to making stoves. All the other manufacturing concerns at Leeds are now in operation, those which were carried down last year having been reorganized.

Sport Among Stove Men.

The Saturday half holiday last week was made good use of by the employees of the Union Stove Works of this city, when 38 of their number repaired to the spacious grounds belonging to Alfred Semler, keeper of the hotel at Grant City, Staten Island. The boys had prepared an elaborate programme to keep them busy until 10 o'clock that night, and had a most enjoyable time.

Among the many events arranged for the day's outing was a match game of base ball in which part of the store force, known as the "Paragon B's," was pitted against the tin shop boys, who called themselves the "Flirt B.'s," resulting in a victory for the latter by a score of 34 to 19. The trophy, a beautiful stove offered by the firm, was carried off by the victors, who also secured an appropriate medal, for which they contested. The umpire, Mr. Tilson, in this game fared much better than some of the players, who, being rusty for such violent exercise, came out of the game rather sore, to say the least, three of the number, Messrs. Schuler, Pennell and James Myers, sustaining many scratches in their endeavors to extricate themselves from the meshes of a barb wire fence, in which they became entangled after chasing the ball outside the grounds. The teams lined up in the following order:

Flirt B.	Paragon B.
T. Tilson, P.	R. L. Myers, C. and
J. Dougherty, C.	Captain.
J. Gould, 1st B.	L. Hatfield, P.
P. Hammill, 2d B.	R. Smith, 1st B.
H. Young, 3d B.	H. Davis, 2d B.
A. Van Sise, S. S.	H. E Sherwood, 3d B
E. Schuler, R. F.	W. T. Edwards, S. S.
C. Reick, L F.	J. H. Myers, L. F.
J. Worster, Captain, C. F.	W. Froel, C. F.
	G. C. Pennell, R. F.

Umpire—John Tilson.

The second event was a 130 yards dash, in which Mr. Worster of the shop outran by two seconds the dignified bookkeeper of the company, P. J. O'Hanlon; but the laurels of the store were retrieved in a like event between Master D. Strade the tinshop apprentice and Master James Dowling, errand boy, who outran the former by four seconds. The fourth event was a running race between E. Suarez and R. Arguiello, two invited guests, in which the latter was best man. The fifth event, a 130 yards dash between Louis Hatfield and Henry Specht, two of the drivers, was won by Mr. Specht, who was two seconds ahead of his rival at the finish. The sixth event, a penny pitching contest between John Dukes of the shop and Harry Chapman of the store, was won by two pennies by Dukes after a close and exciting contest. One of the most laughter provoking events of the day, and which called forth bursts of applause and vociferous urgings on the part of the respective admirers of the contestants, was a jig contest between Mr. Chapman of the store and Mr. Klug of the shop. Under the spur of continued shouts of encouragement they kept up the dancing for 15 minutes, when the onlookers called it a draw, out of pure sympathy for the principals. In a lot

drawing afterward the conteat was decided in favor of Mr. Chapman.

After supper, to which all sat down at 6 o'clock, and for which all had most voracious appetites, ten pins was indulged in. The following is the *menu* of the supper:

Soup à la Revertible Flue.

Clam Fritters with Fancy Nickel Skirt and Legs.

Roast Beef with Low Hot Closet and Reservoir.

Roast Veal with Asparagus and Lettuce elaborately trimmed with Tile.

Roast Chicken with Burnished Edges.

Cream Cakes with Duplex Grate.

Coffee and Direct Draft Segars.

The bowling contest was participated in by the following:

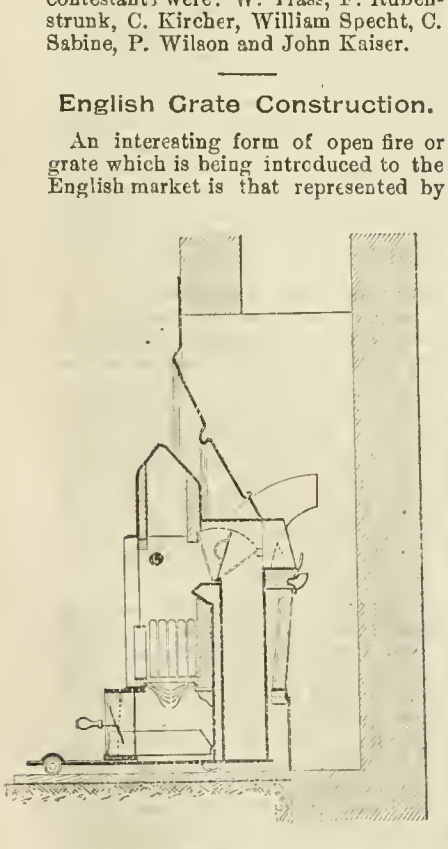
Store.	Shop.
G. C. Pennell,	J. H. Pratt,
J. H. Myers,	John Edwards,
H. E. Sherwood,	E. Jacoby,
R. L. Myers,	E. Schuler,
W. T. Edwards,	C. Reick,
P. J. O'Hanlon.	J. Worster.

It resulted in a victory for the shop hands by a score of 529 to 522.

Charles Specht, a former employee, furnished the music for the occasion on an accordeon, of which he is certainly a master, playing as he does with his nose, ears and chin, and imitated various musical instruments, such as bagpipes, violin, banjo and piano. It was 10 o'clock when the boys boarded the train for home, singing "Two Little Girls in Blue," "Playmates," and several other songs of a *passé* character, and at the imminent risk of being sat upon by other inmates of the car, or of being ejected by the conductor. All, however, voted it one of the grandest outings, marred only by occasional showers, they ever had. Among those present whose names do not appear among the contestants were: W. Trass, F. Rubenstrunk, C. Kircher, William Specht, C. Sabine, P. Wilson and John Kaiser.

English Grate Construction.

An interesting form of open fire or grate which is being introduced to the English market is that represented by



Vertical Section through an English Open Grate.

the sectional view in the accompanying illustration. The arrangement of parts is such, the manufacturers claim, as to result in economy of fuel combined with great efficiency. The device is so made that it may be easily inserted in a fire place, and is furnished with or without a front. The body of the apparatus surrounding the grate is divided by means of fire brick into several chambers, the fire itself constituting the middle division. Above this there is an air flue, for the purpose of carrying the heated air to the fire in order to promote combustion. In the air flue is a register, for the purpose of either allowing a direct draft into the chimney, as in the case of an ordinary grate, or to discharge the products of combustion through the flues at each side of the grate. The arrangement is such that the flues can easily be cleaned by removing covers provided for the purpose, which, in turn, may also be used as ventilators. Where a front is provided there are two sliding mica doors, through the panels of which the light from the glowing coals may stream into the room, thus adding to the cheerful effects produced. The front may be made entirely of cast iron or fitted with tile panels, behind which the mica doors slide when opened. Some of the fronts have perforated borders, through which cold air from the room enters at the bottom, and after circulating about the body of the grate issues at the top in a highly heated condition, thus maintaining a rapid circulation and creating a uniform temperature throughout the apartment. We understand that a room may be warmed in three ways. If the mica doors and register at the back are closed, the fire burns in accordance with the position of the lower sliding door, and the grate yields the largest amount of heat. In the second place, if the mica doors are closed and the register at the back left open, the fire still burns in the manner indicated above, but as there is a direct draft into the chimney only a small quantity of the heat developed is discharged into the room. In the third place, if the mica doors are opened together with the register the fire burns as in the ordinary grate, and, while assisting ventilation, gives very little heat to the room. Ventilation can be secured in the manner indicated by opening a valve in the cleaning covers at the bottom of the side flues. This causes the air from the room to at once be drawn into the flues, and while reducing the draft for the fire gives ample ventilation.

ODD PLATES.

The Excelsior Steel Furnace Company, 38 and 40 West Monroe street, Chicago, have just brought out a new list of furnace fittings. It is printed on a large sheet, 15 x 27 inches, giving illustrations of the various kinds of fittings made by the company. A large addition has been made to the line of stacks and branches. These are now furnished in lengths from 19⅝ inches to 13 feet 6 inches, and can be placed in position without patching or soldering. No solder is used on the hot air pipe, but the joints are double seamed together, while the swedging on the last joint of a length is done with the ridge entirely above the surface, leaving the inside perfectly smooth. This pipe is made up in sections from 14 inches to 5 feet 8 inches in length, each section being complete. Other goods shown are elbows, angles, collars, boots, register boxes, casings, bonnets, and miscellaneous fittings. The price-lists published are very comprehensive, covering all sizes, styles and descriptions of regular and special fittings.

The foundry of Burdett, Smith & Co., at Troy, N. Y., will not resume operations until after July 4. For several weeks the resumption of business has been anticipated by the employees. The foundry has been closed since early last December.

Operations were resumed at the stove plant of Bussey & McLeod, Troy, N. Y., last Monday. The usual force of men was put at work.

Gen. Robert Shaw Oliver, superintendent of the Albany plant of Rathbone, Sard & Co., has been appointed a member of the Civil Service Commission of the city of Albany by Mayor Wilson.

The latest catalogue issued by the Fuller & Warren Warming & Ventilating Company, 43 Milk street, Boston, Mass., is an exceptionally handsome publication. It is of oblong shape, bound in silk, with a finish of gold, while the back is of white with graceful gilt design and the words "Warming and Ventilation" printed in red. The inside of the catalogue is in perfect keeping with the handsome binding. The pages are faintly tinted with white and cream, alternately paneled, the typographical work being done on a paneling of cream color, while the engravings, of which there are many handsome ones, are on a white panel surrounded by a border of the latter color. Large engravings show many school houses and halls and other important buildings in which the Fuller & Warren Warming & Ventilating Company have installed the heating apparatus. Vignettes of some detail of architecture or ornamentation of buildings add much to the charm of the engravings. Of course, the important feature of the work is the description of the warming system that they apply, many interesting diagrams being presented, and full accounts given of the apparatus itself. At the close of the book are many references.

The Southern Stove Works, of which Kiechle, Brentano & Oberdorfer are proprietors, Evansville, Ind., issue an attractive pamphlet, handsomely printed on delicately tinted paper, illustrating the new patterns for 1894 of Our Leader specialties. These include four and six hole wood ranges, embodying the latest improvements and ornamented in a rich and effective manner; a soft coal heater, which is claimed to be mounted absolutely air tight and capable of holding fire 24 hours with soft coal; an attractive Franklin, made in three sizes and having large sliding mica feed doors, capacious ash pan, heavy sheet steel back, iron linings, draw center shaking grate and fire pot, removable through the feed door, and Our Leader four-hole cook stove, made in five sizes for coal and wood. The front cover of the pamphlet is ornamented with a picture of the train containing the company's large shipment of stoves on September 10 of last year, the contents of the train weighing 462,300 pounds, the freight charges being $3107.25.

The Art Stove Company of Detroit, Mich., last week made two shipments of oil heaters to Antwerp and Brussels. The company expect to do considerable business with European countries and are in receipt of numerous inquiries from abroad. They are running their factory with a full force, ten hours a day and six days in the

week. The outlook for a large trade is considered good.

The Joliet Stove Works of Joliet, Ill., are favoring their customers with sheets of blotting paper, one side of which carries a calendar for the month of June and an illustration of Moore's Air-Tight heaters shown with and without casing.

The Sill Stove Works of Rochester, N. Y., issue an attractive folder giving some interesting information relative to the Sterling range, which they manufacture in the usual modifications. This stove is one of the latest additions to the company's already extensive assortment, and is ornamented in a style to please the most fastidious. The effects are rich and artistic and the stove as a whole has a substantial, well made appearance. Particular attention is invited to the fire box, which is extra large, oval in form and has an extra heavy brick lining; also to the company's patent lift-out hearth, which rises up instead of sliding out or swinging to one side, and to the square full size oven which is fitted with patent transparent ventilating double door. By means of the latter fresh air is continually introduced into the oven, while the transparent inner door, fitted with two clear sheets of best India mica, enables the contents of the oven to be seen from any point in the kitchen, while at the same time no risk is run of having a delicate piece of baking spoiled by settling, through the opening of the door. The flues, which are claimed to embody the advantages of both the two-flue and sheet flue systems, without the faults of either, are deep and can be cleaned from the front of the range.

William W. Cornell, who recently died at Poughkeepsie, N. Y., was a native of Troy, N. Y., where he was born 73 years ago. He was a son of the late Latham Cornell and with his father was for many years in the stove business at Troy. The deceased removed from Troy to Poughkeepsie 35 years ago.

The new office building of Cribben, Sexton & Co., adjoining their stove foundry on Erie street, Chicago, is now nearly completed and will shortly be occupied by the firm.

The Peninsular Stove Company, Detroit, Mich., favor us with samples of lithographed hangers with which they are this season supplying their customers for advertising purposes. These are of the usual style and make up, being provided with metal bands at the top and bottom and an eye for hanging upon the wall. The design in each case, however, is far in advance of the general run of advertising hangers, and is of a character to warrant its preservation rather than find a place in the waste basket of the dealer receiving it. In each case the design is different, so as to lend a pleasing variety to the collection. As hangers are issued for advertising purposes it is natural to find some reference to the company's goods printed upon them. The upper left hand corner bears a *fac-simile* of the company's trade-mark, while in the opposite corner is a picture of some one of their leading specialties. The lithograph work is beautifully executed in colors and the designs exceedingly rich and effective.

We have received from the Michigan Stove Company a sample of the patent Schafer lamp shade which they are now furnishing their agents as an advertising device. It consists of a tin holder or spreader to fit on the chimney and a decorated paper shade which folds flat. The *Garland Magazine*, which has also been received, is a 16-page publication, filled with literary miscellany and occasional allusions to Garland stoves and ranges. It is intended to be furnished to dealers for distribution in their immediate vicinity. In such cases the dealer's name is printed on the magazine and copies are furnished him at a very low rate. Circulars are also inclosed giving practical hints in advertising Garland stoves and ranges.

Isaac A. Sheppard & Co. of Philadelphia have been busily engaged in extending their lines of goods, particularly as regards furnaces. Their heating stoves this season will embody some important modifications and improvements, and their line of Fidelity ranges has been enlarged and improved. They are about to place on the market a new four and six hole range in three sizes, bearing the name Royal Excelsior. The range has an end ash pit, high hot closet and reservoir, and will doubtless be in good demand when the season opens.

The Mount Penn Stove Works of Reading, Pa., have issued an eight-page catalogue under the heading "Cellar Furnaces." In it are described and illustrated the Radiant hot air portable furnace, steel drum and crab construction, with single or double casing; the Model portable hot air tubular furnace, and the Palace, a new furnace just introduced as a very cheap and effective cellar furnace. The latter is a steel drum furnace with horizontal air flues and made in three sizes. The last page of the catalogue is devoted to dampers and trimmings.

The Excelsior Steel Furnace Company of 38 and 40 West Monroe street, Chicago, are filling their warehouse at above numbers with furnaces, boilers, heaters, furnace fittings and supplies in anticipation of an active fall trade. At the opening of the shipping season they expect to have on hand fully 1000 furnaces and boilers.

The Front Rank Steel Furnace Company, St. Louis, Mo., have moved from 713 North Main street to larger and more commodious quarters at 705–707 North Main street. In their new location they will occupy two buildings, each four stories in hight. The first floor will be utilized as an office and showroom. Particular attention will be paid the latter. It will be inclosed by partitions of finished white pine, the upper portion being of glass, arranged so as to swing outward, thus obtaining all the necessary ventilation. Arrangements regarding the decoration of the sample room and office are not as yet completed, although it is expected that ornamental sheet iron ceilings and side walls will be used. The sample room will contain a full line of their Front Rank steel furnaces, which will be displayed with and without casing, and also in sections. They will also show their Front Rank water heater, which is just now creating quite a stir in the trade. This water heater was not completed until the latter part of the winter season and their trade was naturally limited. They have completed a number of contracts, however, and those that have been used have given entire satisfaction. The second floor of their new plant will be used as a sheet iron and sheet steel shop, the third floor as tin shop, while the fourth floor will be utilized as a pattern shop. The change made in the location of their plant will enable them to increase their capacity by at least 50 per cent. The two buildings occupy ground 50 x 180 feet.

Buck's Stove & Range Company of St. Louis, Mo., are directing the attention of the trade to the iron clad guarantee which they give in connection with their line of Buck's stoves and ranges They are distributing *fac-similes* of the warranty which they give with every stove made, and point out that the reason their stoves are more durable than others is because no scrap or old iron is used in their construction. Accompanying the warranty is a neat folder entitled "Health and Economy," which deals with the merits of Buck's stoves.

The Rapid Transit Stove & Furnace Company of Baltimore, Md., have issued an illustrated catalogue of their specialties made under the patents of J. B. Oldershaw. Attention is invited to an interesting assortment of heating stoves, furnaces, fire place heaters, &c., the illustrations being accompanied by descriptive letterpress. Instructions are given for setting the Grand Rapid and Rapid Transit fire place heaters, as well as for the Resplendent heater. Some of the goods are made as double heaters, these including the Delta, Diffusive and Rapid Transit.

Hess, Snyder & Co., Massillon, Ohio, are distributing to friends in the trade copies of their 1894 furnace catalogue. It is a book of 84 pages bound in board covers and gives a detailed description of the Boomer furnace, which the makers state has been thoroughly tried and tested. They refer especially to its durability, economy and cleanliness. The illustrations show the furnace in sections and general views and adapted for high and low cellars, Ample descriptive letterpress accompanies the illustrations, and the matter is presented in such shape as to prove interesting and valuable to dealers handling these goods. Not the least important feature of the publication is a partial list of churches and schools in which the Boomer furnace is used, as well as a long list of testimonial letters from those who have practically demonstrated the merits of the heater.

Advices from Phillipsburg, N. J., are to the effect that the Phillipsburg Stove Works will operate their plant three days a week until further notice.

We are indebted to the Carton Furnace Company, Utica, N. Y., for a copy of a circular which they have received from Stearns Brothers, Detroit agents for the Carton furnaces. The circular gives a list of names of some of the dealers who handle the goods named and who have been using them from one to ten years.

Hansell & Belson have now arranged their showrooms, at 144 North Second street, Philadelphia, with the different lines of goods they will handle. They will make a specialty of the stoves of Charles Noble & Co. The second floor front will be entirely devoted to the display of their new Liberty steel ranges and the Dazzle cooker, made by the Philadelphia Stove & Iron Foundry Company. They are selling four grades of oil stoves, of which the Game and Enterprise are leaders. They also handle five grades of gas stoves and ranges, the Enterprise line of Luther & Lederhos occupying the leading position. Their gasoline leader is the Aurora Process, and they sell Moon's

patent flame spreader oven for all their oil, gas and gasoline goods. They also have the agency for their section of the Grinberg Star elbow. They have adopted a trade-mark in which Iron King and Liberty stoves and ranges are the features.

The Reading Stove Works, Reading, Pa., propose starting up in a few days their Millmont plant, with a full force of workmen in all departments. The reason for this is that their warehouse at Foundry No. 2, which with Foundry No. 1 has been running full thus far the present year, is filled with goods, and as the future production must be stored at Millmont, it is much more convenient for the company to make the stoves there than it is to turn them out in Reading and haul them ¾ mile to the warehouse at Millmont. As soon as operations are resumed at the Millmont plant Foundry No. 2 will be closed, for the reason that present trade conditions do not warrant operating more than two-thirds of the company's full capacity. Business is very quiet just now, but the outlook for the fall trade is regarded as favorable. From the above it will appear that the starting of the company's Millmont plant is not due to the receipt of "a large order for heaters of a special size" which cannot be made at their plant in Reading, as some of the newspapers have stated.

The Pittston Steel Range Company, Pittston, Pa., with a capital stock of $10,000, were chartered on Friday, May 25, with the following directors: George B. Reap, M. N. Donnolly, James Kennedy, John Brown and Dr. Joseph Reap.

The Denver, Col., newspapers state that on the 28th ult. the Kibler Stove Works met with an annoying loss in the destruction of a portion of their patterns by a fire which originated in an adjacent plumbers' supply foundry.

The Dippo Mfg. Company of Cleveland and Chagrin Falls, Ohio, have issued an illustrated catalogue of three specialties in their line of Ferrosteel ranges. These goods are made from original patterns and are constructed in the company's works located at Chagrin Falls, about 10 miles out of Cleveland. The ornamentation is of a pleasing character and the constructive features such as to command favorable attention at the hands of the trade. The catalogue consists of 16 pages, presenting half-tone illustrations of several varieties of the Ferrosteel ranges. Accompanying the engravings we find descriptive letterpress together with tables giving the sizes in which the stoves are made, the dimensions of the ovens' code words and prices.

We are indebted to Louis L. Tribus, C.E., 84 Warren street, New York, for a pamphlet copy of a paper read by him last February before the American Society of Civil Engineers, of which he is an associate member, on the subject of driven wells of the Plainfield, N. J., water supply system. The paper gives a very clear and concise account of the water supply system adopted at Plainfield, and numerous engravings make plain all the essential features of it. The wells have been in operation for over two years with the most satisfactory results as to the quality and quantity of water, and are but one of the many examples of the efficiency of the driven well system of supply. In the discussion following the paper reference was made to the similar systems at Natchez, Miss., Topeka, Kan., Dayton, Ohio, and other cities. Mr. Tribus was resident engineer during the construction of the work and is well qualified to express opinions on the important matter of water supply.

SCRAP.

According to the monthly Treasury statement of imports and exports for April, the amount of tin and terne plates held in bond in the United States on April 30, 1894, was 49,246,079 pounds, valued at $1,240,992, as compared with 25,114,881 pounds, of the value of $681,071, held on April 30, 1893, showing an increase of nearly 100 per cent. This increase has become still larger during the month of May and is attributable entirely to uncertainty in regard to the tariff.

The Baltimore Iron, Steel & Tin Plate Company are moving their plant from Clinton and Second streets, Canton, to Locust Point, Md. The firm have secured a lease for three years on the property and plant of the old Coates Rolling Mills, at Locust Point, with the option of purchase.

Bruce & Cook, 186–190 Water street and 248 and 250 Pearl street, New York, are offering to the trade a new brand of American roofing tin named Petrel, which is being made especially for them. It is described as a highly finished bright coated terne plate equal to P. T. L. Another specialty of the firm in American roofing plates is W. T. R., a dark finish terne of Worcester grade. Messrs. Bruce & Cook report a large and growing demand for these domestic plates.

A member of the New York metal trade, who has recently returned from a Western tour, in the course of which he visited a number of the American tin plate works established west of the Alleghanies, describes their importance and activity as astonishing. Leaving the city in the character of a skeptic open to conviction, he has returned an enthusiastic convert. The progress of the large tin plate concerns established in Indiana, Western Pennsylvania, Ohio and Missouri he found to be remarkable. All were filled up with orders and only feared the effects of the coal strike. The magnitude of the works of the St. Louis Stamping Company at St. Louis, Mo., appears to have produced a particular impression on this individual's mind. That tin plate manufacturing is already an established and important industry in this country is, he says, not in the least doubted in the West.

Laufman Tin Plate Company, whose works are located at Butler Junction, on the West Penn Railroad, with post office address at Freeport, Pa., issue a neat circular calling attention to their brands of American roofing tin, and giving a number of flattering testimonials from metal roofers in various parts of the country in regard to their plates. In addition to their well-known brand of guaranteed roofing tin—Laufman's Apollo, the firm are making and offering to the trade the following roofing plates: Tip Top, described as a machine made, full coated and squared terne; Allegheny, machine made and squared, and Freeport, a hand redipped and resquared plate. The last named is the latest addition to the firm's products. All these plates are made with a palm oil finish. The Laufman Tin Plate Company roll their own black sheets from best decarbonized steel, and all their plates are guaranteed to double seam.

N. & G. Taylor Company, Philadelphia, Pa., report that the output of tin plates for the week ending May 26 was the largest since they started their works some two years since. They are enjoying an excellent demand for their bright and roofing tins.

Estimates and plans are being prepared for a tin plate plant to be added to the Lalance & Grosjean Mfg. Company's rolling mills, at Harrisburg, Pa. The company's mill in that city has a large capacity in the production of black sheets for tinning purposes. Most of this product is used in the firm's own tinware factory on Long Island, and the balance has been in great request by tin plate makers.

A fire was discovered on the morning of June 2 on the fourth floor of N. & G. Taylor Company's store, at 395 Branch street, Philadelphia. The flames, which were sufficiently fierce to melt the pig tin stored there, were fortunately confined to that one section of the building by means of the iron fire proof doors, and the fire was quickly subdued. The loss is estimated at about $2000, and is fully covered by insurance. The origin of the fire is unknown.

In the burning, last month, of the Clyde Line wharf, on the East River, New York, a considerable number of boxes of imported tin plates were destroyed or damaged.

A London cable dispatch reports that the works of the Pontymister Tin Plate Company, Newport, and of the Maesteg Tin Plate Company, Llwydarth, two of the most important tin plate works in South Wales, started into operation again this week.

New Publications.

Directory of the Iron and Steel Works of the United States, Canada and Mexico. Compiled and published by the American Iron & Steel Association, Philadelphia.

James M. Swank's directory of the iron and steel works has always been the closest approach to the ideal of such a publication with which we are acquainted, and is thoroughly appreciated in the trade, by which it is regarded as a standard work. With the growth of the industry the difficulties attending its compilation are growing steadily. It is so thoroughly known that it requires little more than the announcement that a new edition has been issued to commend it to those interested. It contains as usual a full list of the blast furnaces, rolling mills, Bessemer steel works, open hearth steel works, crucible steel works, plate and sheet mills, cut nail factories, stamping works, forges and bloomaries, wire rod and wire mills, wire nail factories, bridge building works, iron and steel shipbuilders, horse nail works, locomotive works, cast iron pipe shops, wrought iron pipe works, car axle makers, car wheel foundries, and car builders. Similar information is furnished for Canada and Mexico.

The Tin Mill Ready Reckoner. By Ambrose Beard, New Philadelphia, Ohio. Price, 75 cents.

Mr. Beard's "Tin Mill Ready Reckoner" is a handy little pamphlet which contains a series of tables of calculations for quickly computing the wages of tin mill rollers, doublers, heaters and shearmen under the Western scale.

TRADE REPORT.

The Iron Market.

Pig Iron. — In the New York market, although some of the Southern furnace companies have advanced their asking prices, there is no evidence that buyers are paying more. There is some scarcity, however, in Soft grades. While the threatened advance in freight rates has stimulated shipments the fact remains that the current demand is not heavy. We quote standard brands $12.50 @ $13 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No 4 (Foundry Forge) is $9.75 @ $10.25.

There is more doing in Pig Iron, and prices, if not fractionally higher, are certainly well maintained in the Philadelphia market. There is no very strongly defined increase in the demand, but with so many furnaces banked, and the prospect of higher freights from the South and West, holders are less urgent in making sales, unless at figures that come pretty close to $11.75 for No. 2 X, and $10.50 @ $10.75 for ordinary to good mill Irons. Several sales of 1000 tons each and upward have been made of the ast mentioned at $10.50, which appears to be an inside quotation for that class of Iron, although there are full supplies at that figure for Philadelphia deliveries and at 25¢ @ 30¢ less at points such as Harrisburg and York. General quotations for Philadelphia and equivalent points are about as follows :

andard No. 1 Foundry X....	$12.50 @ $12.75
Standard No. 2 Foundry X....	11.50 @ 11.75
No. 2 Plain.....	10.75 @ 11.00
No. 1 Soft.....	11.50 @ 11.75
No. 2 Soft.....	10.75 @ 11.00

Advices from Chicago indicate that the market is hardening. Large sales of local Coke Iron have been made at firm prices and offers are refused which would have been accepted only two weeks since. Manufacturers again appear to be in command of the situation and consumers are gradually recognizing this fact. Southern Coke is quiet. Such Iron as is now selling is on the basis of a price at the furnace, and not delivered, as makers will not take chances of an advance in freight rates. Sales of Lake Superior Charcoal Iron are reported in somewhat larger quantity than for several weeks past. Bankrupt stocks are now disappearing and the market is working into better shape. Quotations are given as follows for cash:

Lake Superior Charcoal.....	$15.00 @ $15.50
Local Coke Foundry, No. 1...	11.25 @ 11.50
Local Coke Foundry, No. 2...	10.50 @ 11.00
Local Coke Foundry, No. 3...	10.00 @ 10.50
Local Scotch.....	11.50 @ 11.75
Ohio Strong Softeners No. 1..	13.00 @ 13.50
Southern Silvery, No. 1.	..... @ .....
Southern Silvery, No. 2.....	..... @ .....
Southern Coke, No. 2..... ...	10.00 @ 10.35
Southern Coke, No. 3.....	9.75 @ 10.00
Southern, No. 1, Soft.....	10.25 @ 10.50
Southern. No. 2, Soft.....	10.00 @ 10.25
Tennessee Charcoal, No. 1...	. ...@ .....
Tennessee Charcoal, No. 2....	..... @ .....
Alabama Car Wheel.....	17.50 @ 18.00
Jackson County Silvery.....	15.00 @ 16.00

The Pittsburgh market is reported bare of sales and of material as well. Mill Iron is stiffening in price, and $9.75, Pittsburgh, is the minimum price to-day, a sale of 500 tons having been made at that figure last week. There is little or no demand for Foundry Iron, but in spite of this furnaces are asking more money, and it is doubtful if $10.75, Pittsburgh, for No. 2 could be shaded. A sale is noted of 300 tons No. 1 Foundry last week, at a price equal to $11.20, Pittsburgh. In the present situation with no transactions occurring, quotations are merely nominal. For spot deliveries the following prices are quoted:

No. 1 Foundry..	$11.50 @ $11.75 Cash.
No. 2 Foundry.....	10.75 @ 11.00 "

The situation in the Cincinnati Pig Iron market has been much the same as the previous week. Some furnaces with Pig Iron to sell have met the demand quite freely, but there were no large transactions, and yet the aggregate of the jobbing sales was considerable, and while the bulk of trade was for Foundry Coke Iron, there were larger proportionate sales of Southern Charcoal Iron. There are comparatively few Southern furnaces that have Iron to sell, and they are talking higher prices, but the scarcity of fuel is decreasing the demand as well as the supply, for many of the jobbing foundries in the district are closing because they cannot get Coke or Coal. The market closed strong. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke, No. 1.....	$10.25 @ $10.50
Southern Coke, No. 2.....	9.25 @ 9.50
Southern Coke, No. 3.....	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1....	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2....	14.00 @ 14.50
Lake Superior Coke, No. 1.....	12.50 @ 13.00
Lake Superior Coke, No. 2.	11.50 @ 12.00
Hanging Rock Charcoal, No. 1..	17.00 @ 17.50
Hanging Rock Charcoal, No. 2..	16.50 @ 17.00
Tennessee Charcoal, No. 1.....	13.00 @ 13.50
Tennessee Charcoal, No. 2.....	12.00 @ 12.50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable.....	16.25 @ 16.75

The only feature of interest in the St. Louis market is the scarcity of No. 1 Foundry. The output of this grade of Iron is very limited, and $8.25 @ $8.50 is now quoted for prompt shipment. The consumption of Iron is limited, which is, however, offset by the limited production. Consumers being unable to obtain their usual supply of Coal, Coke, &c., are also reducing their shipments of Iron, and furnaces have no alternative but to hold the Iron for further instructions. Prices are firmer all along the line, but are not as yet quotably higher. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$11.00 @ $11.25
Southern Coke, No. 2 Foundry	10.00 @ 10.25
Southern Coke, No. 3 Foundry	9.75 @ 10.00
Southern Car Wheel.....	17.00 @ 18.00
Lake Superior Car Wheel..	16.25 @ 16.50
Ohio Softeners.....	14.25 @ 14.50

The past season has been a hard one for lake marine insurance companies, owing to the unusually large number of vessels lost on the lakes. The companies are advancing their rates from 50 to 150 per cent.

Metal Market.

Pig Tin.—Wholesale prices have moved slowly but steadily downward, and show for the week a decline of about 0.20¢. The fall is due in part to lower London market, but increasing supplies and dull general trade have helped in some degree. Spot stocks increased last month to the extent of about 305 tons. Thus far this month 225 tons have arrived. There are now afloat 1900 tons. The available supply for early delivery is about 3000 tons, or 750 tons larger than a month ago. European and American visible supply combined was 18,983 tons June 1, showing an increase of 2593 tons since January 1. The demand for Pig Tin for consumption is referred to as commonplace in the extreme. The jobbing price for small lots of Straits Pig is 21¢ @ 21¼¢ ℔ lb for small lots.

Copper.—The market is somewhat unsettled and weak, owing to the placing of orders for a large quantity of Lake Superior Ingot for delivery several months ahead at a very low figure. The amount is understood to be about 10,000,000 lb. Cheap grades of Copper for prompt delivery are rather scarce, but the present requirements of consumers are moderate and business limited in volume. Prices for small lots are unchanged at former quotations.

Sheet Copper.—No improvement worth mentioning has developed in the demand for Sheet Copper. Purchasing by consumers continues on a cautious, narrow scale. Prices are unchanged and firmly held. For small lots from store a 15¢ ℔ lb, net, basis is the rule.

Pig Lead.—A more active general market has been experienced, and at the close it showed a better tone than has been the case of late. Some good sized transactions are reported to have passed, but the current jobbing demand for both Pig and Manufactured Lead presents no new features, either in the way of improvement or the reverse. For American Pig, in moderate quantities, 3⅞¢ @ 4¢ is the ruling price.

Spelter.—There is little business doing in Spelter in this market, which remains dull and somewhat weak. Prices are not, however, any lower. Small lots of Western fetch about 4¼¢ ℔ lb.

Sheet Zinc.—Another sharp advance has occurred in the price of this material during the past week, and it is expected that quotations will go still higher, owing to the closing down of the works, following on the scarcity of fuel. Meanwhile the demand is tame, but enough to cause a steady shrinkage in stocks. Current quotations are 5½¢ ℔ lb for 600-lb casks, and 6¢ for smaller quantities.

Antimony —Only a routine business is doing, yet enough to keep prices steady. Quotations are unchanged.

Nickel.—About 45¢ @ 50¢ is quoted for fair sized lots, with the usual premium in smaller quantities.

Tin Plates.—The condition of the Tin Plate market is one of uncertainty

and suspense. Business is irregular, being good one day and flat the next, while the general policy continues to be to proceed cautiously with both spot purchases and orders for forward shipment. In the early days of the week some little impetus was given to trade by the placing of a few good sized orders by Southern Can makers, but inquiries from this class of consumers slacked off toward the close of the week. The cold and stormy weather experienced of late has given a set back to canning operations for the present, but requirements from this quarter may again revive with the advent of more seasonable weather. There is a fairly active demand for Roofing Ternes, especially those of domestic manufacture, prices for which are well maintained. General Tin Plate quotations show no radical change. Concessions are, however, less easy to obtain, owing to decreased importations and gradually lessening stocks on this side.

A special cable dispatch from London to *The Iron Age*, dated June 6, describes the British Tin Plate market as firmer. There is more inquiry for forward deliveries, but sellers are asking a large premium and that checks business. Prompt shipments are in poor request, however, with Bessemer Cokes at 10/. Ternes are stiffer on better demand. Swansea quotations are as follows:

Bessemer Cokes, 14 x 20..... .. 10/	@ 10/1½
Siemens Cokes, 14 x 20. ...10/4½	@ 10/6
Ternes, double box. 18/6	@ ..
Charcoals..... .....13/	@ 15/

Sheet Iron.—Black Sheets for tinning are in particularly good demand, and some heavy sales have been made. Manufacturers' books are well filled with orders, and Tin Plate works are experiencing some difficulty in obtaining a sufficient stock of plates for the purposes of their busines. Other qualities of Black Sheets are in moderate demand, and prices display a firmer tendency. Galvanized Iron is rather more active, with prices firm at 75 % @ 75 and 5 % off for small lots from store.

MATTHAI, INGRAM & Co., Baltimore, Md., issue a supplementary catalogue showing the recent additions to their line. It is to be used in connection with their general catalogue No. 20 or No. 21. They announce also that they have new goods in contemplation and will be glad to receive inquiries from the trade. The present supplementary volume contains 25 pages with illustrations and prices and relates to Dippers, Ladles, Skimmers, Coffee Pots, Tea Kettles, Pails, Buckets, Ash Pans, Oil Cans, &c. A second catalogue that they are distributing is a neat little pamphlet bound in gray with silver lettering, devoted entirely to what they term "Old Time" Tinware, which is the name they use as a trade-mark. Old Time Tinware is wrapped, tagged and labeled, and it is specified that the best care is bestowed upon the packing and shipping. They also emphasize the high grade of the articles. The Ware includes a large assortment of Kitchen Utensils, such as Tea Pots, Coffee Pots, Boilers, Saucepans, Sauce Pots, Cups, Dippers, Bowls, Baking Pans, &c. Among the other articles enumerated are Dinner Kettles, Funnels, Scoops and Wash Boilers. All the goods are illustrated and full price lists are given.

Reports from the Northwestern States point to excellent crop prospects in nearly every district. The promise of a large yield was never better at this season of the year.

Chicago Report.

Scrap.—No change has been made in the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap.....	$7.00	....
Machinery Cast.....	6.00	....
Malleable Cast...	5.00	....
Stove Plate (free of burnt)..	4.00	....
Burnt Iron and Grate Bars..	3.00	....
Sheet Iron and Hoops.. .	2.00	....
Plow Steel and Breaking Stock.....	4.00	....
No. 2, such as Shovels, Hoes, &c.....	3.00	....
Old Boilers—whole (Iron)....	3.00	....
" (Iron)—cut in single Sheets and Rings..	5.00	....
Old Gas-Pipe and Boiler Tubes.....	5.00	....
Cast Borings.....	3.00	....
Turnings.....	4.00	....
Horseshoes.....	8.00	....
Copper Bottoms.....	....	5½¢
Copper Clips and Heavy.....	....	7 ¢
Heavy Brass.....	....	5½¢
Light Brass.....	....	3 ¢
Pipe Lead.....	....	2¼¢
Tea Lead...	....	2 ¢
Zinc.....	....	2 ¢
Rubber.....	....	3½¢

Anthracite.—The demand has been excellent for the past week and an advance of 25¢ ℔ ton has been made. Carload lots of 12 net tons or over are now quoted as follows:

	Grate.	Egg, Sto. and Ch
Chicago, Ill.....	$5.25	$5 50
Milwaukee, Wis.....	5.25	5.50
Kansas City, Mo.....	8.45	8.70
Council Bluffs, Iowa.....	8.45	8.70
Lincoln, Neb.....	8.60	8.85
Sioux City, Iowa.....	8.45	8.70
Aberdeen, S. Dak.....	8.50	8.75
Dubuque, Iowa.....	6.55	6.80
Madison, Wis.....	6.75	7.00
St. Paul, Minn.....	7.75	8.00
Burlington, Iowa.....	6.75	7 00
Des Moines, Iowa.....	8.20	8.45
Davenport, Iowa.....	6.55	6.80
St. Joseph, Mo.....	8.45	8.70
Leavenworth, Kan.....	8.45	8.70
Omaha, Neb.....	8.45	8.70

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver.....	$8.00
Pueblo.....	8.00
Colorado Springs.....	8.00
Leadville.....	8.00
Cheyenne, Wyo.....	10.00
All points between Denver and Missouri River.....	8.85

According to a recent opinion rendered by Attorney-General Olney, merchandise that has been in bond for the full limit of time may be exported and brought back again as an original importation entitled to another three years in bond. This opinion traverses a recent decision of the Solicitor of the Treasury that such goods could not legally be reimported with the privileges of an original importation. In view of prospective tariff reductions, the Attorney-General's decision will have a considerable interest for the owners of some classes of goods now lying in bond which have nearly reached their limit.

The official Treasury statement places the stock of gold, gold coin and gold certificates in the United States, on June 1, at $665,000,000. Of this amount the national banks of New York State hold $85,700,000, Illinois coming next with $26,000,000 and Pennsylvania third with $20,650,000.

May's fire losses in the United States, according to the lists published by the *Journal of Commerce*, reached a total of $10,777,800, compared with $11,540,000 in the previous month and $10,427,100 in May, 1893.

CONDITION OF THE

Hardware Trade.

CAREFULLY assorted orders for small quantities of goods have characterized the trade for the past month, though the opinion is generally expressed that the volume of business for May compares favorably with the preceding months of the year. The market on Wire Nails shows considerable strength at the recent advance in price, though there is a disposition on the part of buyers to purchase only for immediate requirements in anticipation of lower prices. The unfavorable weather for the past two weeks has added to the sluggishness of trade, diminishing the demand for such seasonable goods as Lawn Mowers, Freezers, Hose, &c., while restricted building operations limit the demand for Builders' Hardware. There is, however, every reason to expect a continuance of the present volume of business, except perhaps such a falling off as may naturally be attributed to the ordinary dull summer months upon which the trade is about entering.

Advices from Chicago.—The Shelf Hardware jobbers are enjoying a somewhat better trade than had been expected after the advance in Western freight rates last week. Orders have kept up from the various parts of their territory in good shape. They are not large, but fairly numerous, and the influx is steady. Very little buying is being done for stocking up, but the demand seems to be continuous for assorting. Even the trade in seasonable goods continues along in about the same way with a regular demand for small lots, showing that the trade is being kept well in hand and that the future has not been anticipated to any extent. For this reason jobbers are inclined now to believe that trade may continue steady for another month at least. A disposition is noted in some directions to increase orders for staple goods, probably owing to the strength of raw materials, which is perceived by all who are in touch with the iron trade. Wire Cloth is firm at $1.60, with an unusual demand recently for large quantities from unexpected sources. House Furnishing Goods and Tinware are dull and are expected to continue so until workingmen are better employed. Roofing Plates are scarce and firm. Heavy Hardware jobbers have had much better trade during the past two weeks, which is largely in consequence of the closing down of so many mills, thus throwing business into jobbers' hands which usually goes to the manufacturers. This is a trade which is liable to be cut off soon by resumption of mills, but in the present uncertain condition of labor troubles may last for some weeks.

Notes on Prices.

Wire Nails—The Wire Nail market still shows an upward tendency and continues strong at the advance noted last week of $1 15 in car lots at mill. Owing to the higher price of raw material manufacturers show no disposition to shade these figures, although buyers are ordering in limited quantities to meet present requirements. Small lots from store in New York are held at $1.25 to $1.30

Advices from Chicago.—The advance in freight rates from the East on the 15th is mentioned by manufacturers as an additional element of strength in the Wire Nail market, which will fortify the position they have taken for advanced prices in consequence of dearer raw material. Some large sales have

recently been made to jobbers in the Northwest, but orders in this immediate vicinity have been comparatively small, as large stocks are still held here which are offered at prices a little below those made by manufacturers. Quotations on factory lots are still about $1.20, Chicago, but manufacturers talk of advancing this week. Small lots from stock are selling at $1.20 to $1.25, and jobbers report an increasing inquiry from the retail trade.

Cut Nails.—There is no change in the condition of the Cut Nail market, while the same conditions which prevailed last week continue to strengthen prices. Quotations remain unchanged and only a fair demand is reported. Eastern mills are quoting 95 cents to $1 for Nails delivered on dock in New York. Small lots from store are held at $1.10 to $1.15.

Chicago, by Telegraph.—Local manufacturers of Steel Cut Nails have had a good trade and report specifications coming in freely on orders they have booked. Prices on factory lots are continued at 90 to 95 cents on 55-cent average. Jobbers have had a somewhat lighter trade in Cut Nails recently, but quote prices at $1.10 to $1.15 from stock.

Barb Wire.—The demand for Barb Wire is only moderate, with no change in the condition of the market. Prices continue firm, the market being represented by the following quotations for Four-Point Galvanized, delivered at the points named: Pittsburgh, $2.05 to $2.15; Cleveland, $2.10 to $2.20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.20 to $2.30.

Chicago, by Telegraph.—Manufacturers state that while shipments of Barb Wire are not so heavy as before the recent advance in freight rates to the West, yet they are keeping up better than had been expected. The advancing tendency in the price of Iron and Steel seems to be stimulating buyers to take in larger stocks of Barb Wire and for this reason trade continues in fair condition. Prices are very firm, in some cases an advance being asked, but for the present prices of Galvanized may be quoted at $2.30 to $2.35 in small lots, with 10 cents off for carloads.

Chain.—The Chain market continues without important change in its general features. The demand is referred to as small, but the manufacturers have avoided accumulating heavy stocks, so that the amount of Chain on hand at present is unusually light. Prices have been somewhat unsettled and lower figures are named, but there is at present a disposition to refuse to make further concessions. Jobbers have, with very few exceptions, been buying from hand to mouth and their stocks are unusually light.

Boss Instantaneous Mending Cone.—P. D. Murphy, Lockport, N. Y., is putting on the market this article. The Cones are sold to the trade at the following net prices:

One box	$0.25
One dozen boxes	2.00
Three dozen boxes	5.25
Six dozen boxes	9.00
One gross	15.00

Glass.—Little of interest has transpired during the past week in the Glass market, while the demand continues restricted. The rainy weather of the past two weeks has retarded building operations throughout the country, and has to a large extent affected the distribution of Glass. Prices, as a rule are well maintained, although under some conditions quotations have been shaded. The New York market is represented by quotations on American Window Glass of 85 per cent. discount for single and double strength Glass in car lots, and 80 and 20 per cent. discount in smaller quantities. Plate Glass is in fairly good demand, with prices firm at 70 and 5 per cent. discount.

Old Metals. — Business is quiet. Some comparatively large sales of Scrap Iron have been made during the week, but generally at prices which touched bottom figures. The following quotations represent about the dealers' prices paid in this city for Old Metals:

Heavy Copper	₩ lb	6¾¢
Light and Tinned Copper	₩ lb	6 ¢
Heavy Brass	₩ lb	4½¢
Light Brass	₩ lb	3¾¢
Lead	₩ lb	2½¢
Tea Lead	₩ lb	2¼¢
Zinc	₩ lb	2 ¢
No. 1 Pewter	₩ lb	12 ¢
No. 2 Pewter	₩ lb	6 ¢
Wrought Scrap Iron	₩ gross ton	$7.00
Heavy Cast Scrap	₩ gross ton	7.00
Stove Plate Scrap	₩ gross ton	3.50
Burnt Iron	₩ gross ton	2.50

Old Rags, Paper, &c.—The market is quiet and prices firm. The following are the current rates paid in New York for Old Rags, Paper, &c.:

No. 1 White Rags	₩ lb	3¼ @	3½¢
No. 2 White Rags	₩ lb	2 @	2¼¢
Mixed Rags	₩ lb		2¼¢
Blues and 3ds	₩ lb	1 @	1½¢
Hard Sized White Shavings	₩ lb	2½ @	2¾¢
No. 1 White Book Shavings	₩ lb	1¾ @	2⅛¢
No. 2 White Book Shavings	₩ lb	1⅛ @	1½¢
Light Book Shavings	₩ lb		¾¢
No. 1 Mixed Shavings	₩ lb	1 @	1¼¢
No. 2 Mixed Shavings	₩ lb	¾ @	1 ¢
No. 1 Printed Books	₩ lb	1 @	1¼¢
Ordinary Mixed Books	₩ lb	½ @	¾¢
Newspapers	₩ lb		2-5¢
No. 1 Manila Paper	₩ lb	¾ @	1 ¢
No. 2 Manila Paper	₩ lb	⅝ @	¾¢
Bogus Paper	₩ lb		½¢
Common Paper	₩ lb		⅜¢
Straw Chips	₩ lb		¼¢
Binders' Clippings	₩ lb		½¢
Jute Butts	₩ lb	1⅛ @	2 ¢
No. 1 Jute Bagging	₩ lb	1 @	1¼¢
Mixed Bagging	₩ lb	¾ @	1 ¢
No. 2 Bagging	₩ lb	½ @	¾¢
Hemp Twine	₩ lb	2 @	2¼¢
Manila Rope	₩ lb	2⅛ @	2¼¢
Jute Rope	₩ lb	1½ @	1¾¢
Mixed Rope	₩ lb	¾ @	1⅛¢

Old Rubber.—The following are about the prices for Old Rubber, delivered in New York, except where otherwise stated:

Car Springs, ton lots, ₩ lb.	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ₩ lb.	@	.03½
Rubber shoes, less than carloads, ₩ lb.	@	.03¼
Large Hose, ₩ ton	@	12.00
White Wringer Rolls, ₩ lb.	@	.03¾
White Syringes, ₩ lb	@	.03¾

Trade Notes.

"Poison in the Pot" is the startling title of a little circular issued by Manning, Bowman & Co., 57 Beekman street, New York. The meaning of this frightening title is explained in the inner page of the circular, where it is pointed out that cheap copper Pots, nickel plated, are often dangerous vessels to use. Lead is apt to be present, and verdigris forms from the copper. At the close the merits of the white porcelain lined Agate Ware are touched upon.

The New Era Iron Works, Dayton, Ohio, issue a pretty little circular relating to the New Era Gas and Gasoline Engines of their manufacture. A general description is given of Gas Engines, and it is pointed out that they are very convenient and economical for many purposes. Particular emphasis is laid upon their desirability for electric lighting.

B. F. Perkins & Son, Holyoke, Mass., publish a neat illustrated catalogue and price-list of their manufactures. Their specialty is the Perkins Improved Ventilating and Exhaust Fan, which is made for vertical and horizontal setting; also Wall Fans, Mill Ventilators, Blower Fans, &c. They also make a Fan with high speed engine connected with it. All these Fans and Blowers are illustrated in the catalogue, and descriptive particulars tell of their important features. Their improved Fan Box is the subject of a special notice. An interesting feature of the circular is the account of their method of testing Fans. Following the notice of the Fans is a long list of testimonial letters and references. Special machines and fittings for paper makers are noted at the end of the pamphlet.

The New Era Iron Works have been incorporated at Dayton, Ohio, with a capital of $50,000, to manufacture Gas Engines and iron specialties. Their Engine, the New Era, which, we understand, has been in successful operation for nearly two years, will be built principally in the larger sizes, and especial attention given to its construction for private electric light plants.

The Excelsior Steel Furnace Company, 38 West Monroe street, Chicago, in their advertisement in this issue give an illustration on a large scale of one of their complete double Stacks. These are made 10 feet 6 inches long, with heads and nailing straps attached, ready to put in without piecing or soldering. The company manufacture and carry in stock nearly 400 different sizes and lengths of double and single Stacks.

The advertisement elsewhere of the Bolgiano Mfg. Company, 415 Water street, Baltimore, Md., will be of interest to many readers. The two specialties alluded to are the Little Giant Water Motor and the Perfection Gas Iron.

R. E. Dietz Company, 60 Laight street, New York, advise us that they are doing a very good export trade, mentioning one order for over 1800 Street Lamps for the city of Para.

The Hartman Mfg. Company of Elwood City, Pa., manufacturers of Hartman Wire specialties, have recently made shipments of Fencing to France, South America and Japan. Last week this concern prepared two shipments, aggregating 5 tons of Wire, for export to Argentine Republic, South America.

The New Castle Galvanizing & Chemical Company, Newcastle, Pa., have been chartered, with a capital stock of $10,000. The directors are A. Johnston, D. R. Jenkins and H. Copewell, all of New Castle.

For the accommodation of their patrons in the East the Geuder & Paeschke Mfg. Company of Milwaukee, Wis., have established an agency with the Central Stamping Company of New York, for the sale and distribution of their Cream City Flour Bins and Sifters in the New England, Eastern and Southeastern States. The Central Stamping Company will carry a full stock of bins and all orders intrusted to them will be promptly filled.

S. B. Corby, 31 South Canal street, Chicago, Western manager for the Huyett & Smith Mfg. Company, issues a neat illustrated circular calling attention to the Smith Patent Ventilating Fan as a seasonable requirement with

the approach of the heated term. These Fans are furnished with and without electric motors.

FLASHINGS.

Geo. A. Katz, for a number of years with Edward Kirk, Jr., has purchased W. B. White's factory, 62 and 64 Pacific avenue, Chicago, and will continue manufacturing copper and galvanized iron cornices, skylights, tin, slate and iron roofing at the same place.

The American Roofing Company, St. Louis and Cincinnati, report their business for the month of May as being in excess of the corresponding month of last year. With factories located in both St. Louis and Cincinnati, they are in position to take advantage of any cut in freight rates either East or West. They advise us that their June business is excellent so far as it has gone, and they look for a continued good demand during the entire month.

The Knisely & Yeldham Company, 68 to 74 West Monroe street, Chicago, are to do the slating, galvanized iron cornices, gutters, &c., for the new school building, South Evanston. Also the slate roofing for the new building of the Famous Mfg. Company, East Chicago, Ind.

Shop Nomenclature.

Every trade is prone to develop a distinct dialect or set of technical terms and phrases—as a rule, most appropriate to its character but likewise almost unintelligible to the outsider. The machinist can talk a language that is no clearer to the uninitiated than that of the abstruse scientist, except, perhaps, because of a certain symbolic meaning to be found in many of the technical terms. In fact, one cannot fail to be impressed with this spirit of symbolism as he hears the familiar names of parts of the human body applied to inanimate tools and machines. The character and use of the lower portion of a machine is vividly presented to the mind when it is called a leg or a foot: the terms "body," "head" and "back," mechanically applied, are immediately clear to us, while there appears at once a fitness in the "arms" of a pulley, the "hands" of a watch or the "fingers" of a clutch. "Eyes" and "ears" are certainly suggestive terms when they refer to objects with which the machinist has to do, and so we find both similarity of form and use existing between the human jaw and teeth and the "jaw" of a vise or the "teeth" of a saw. Seemingly, having exhausted the body as a source, the versatile mechanic has turned to the clothing we wear. He can show one either a "shoe" or a "cap;" will place a "button" where it will do its duty as a knob or will hold two pieces together; he will even fit a "collar" or a "sleeve" over a shaft. All this in the way of curious terms and striking resemblances, but there is withal an important side to this matter of technology, or rather technical dialect. As it is well to-day that all men of science and letters can communicate through one language, the Latin (although it be dead to the world at large), so it is desirable that, at least within the limits of our own English tongue, there should be agreement among technologists, professors and artisans as regards technical terms and their definitions. For this dialect changes with the locality. Words that are familiar to us upon this side of the Atlantic are simply unintelligible to the English mechanic, and perhaps even more generally the reverse is the case. Thus the pitman of the Englishman or of our own old millwrights becomes the connecting rod of to-day and of this country. The punching bear is almost unknown to us by name, but the term screw punch is at once suggestive and explanatory of a common tool. The tap bolt of one locality is the cap screw of another, and so on. Mechanical and technical dictionaries of course serve to clear up some of the difficulties, but nothing is truer than that the lexicographer records but does not originate the terms or their definitions. In many a shop the origin of certain accepted titles can be traced back to the facetiousness of some workman who in the spirit of humorous comparison gave a symbolic name with such fitness that moral suasion could not overcome it. In fact, things must have a name, and if not well christened they are sure to be badly nicknamed. Indeed, it is common to find an article known by one name in the office and drafting room and by another entirely different in the shop. Thus the simple and explanatory title "bed" (of an engine) was found in one case to have been turned into "bullhead" by the molders, notwithstanding that there appeared neither symbolic nor sentimental reason therefor. The draftsman is often much troubled by this action on the part of the workmen. He gives his drawing a certain title or makes an itemized list of the parts, giving to each a name, but finds subsequently that his terms and titles when expressed in shop orders are not perfectly intelligible. His titles are likely to be long, but intentionally comprehensive, nevertheless his "regenerator spring rod clamp" is likely to be christened by the workman with a name perhaps less explanatory, but assuredly simpler and shorter. In this matter there should certainly exist the spirit of co-operation. There is no use in trying to make a bird sing that won't sing, and therefore there should be such agreement upon terms and titles that no misunderstanding can possibly arise.

Waste of Natural Gas.

Only the other day, in conversation with a well-known manufacturer, says a writer in the Pittsburgh *Dispatch*, I mentioned that the system of burning gas which he employed in his work was most extravagant and wasteful. I detailed to him some of the latest improvements which had come to my notice, when he turned around in his chair and remarked: "You don't seem to understand that we have our own well. What is the use of economizing? If we don't get the gas, Mr. —— will," mentioning the name of a gentleman who had wells close by him. Here was an instance of utter disregard for economy in the use of a good thing. It is so all over the country. Why, if all the gas burned and wasted in Pittsburgh were made out of oil, the entire output of the country would not produce it. There will have to be some material changes in the methods of burning gas before manufactured fuel can take the place of natural gas and make a profit for the gas companies. Theoretically, gas making is about perfect in its process, 90 per cent. of the coal being saved, but the most troublesome and as yet unsolved problem is how to handle it. If the supply required was always uniform there would be no trouble, but as the demand might fall from several million feet in the morning to several thousand feet in the afternoon, the gas maker who would supply the general trade has a problem which is indeed difficult to solve.

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Metal and Miscellaneous Prices.

CHICAGO, JUNE 7, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Jalland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 18.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.60
	DX, 12½ x 17	@ 8.50
Allaway Grade.	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.35
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20	@$5.60
IC, 14x20.90 lb	@ 5.35
IC, 14x20, 100 lb	5.50 @ 5.85
16 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	
IC. 14 x 20	@ $5.50
20 x 28	@ 11.00
IX. 20 x 28	@ 14.00
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@
IC, 20 x 28	12.25 @
IX, 14 x 20	7.62½@
20 x 28	15.25 @

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.60	15.80
XX, 14 x 31	16.50	17.60
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.55
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal, extra, IC, 14 x 20.... 7.25
Merion, IC, 14 x 20.... 7.00
Almond, IC, 14 x 20.... 6.50
Mint, IC, 14 x 20.... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.50

Roofing Plates.

Palm, IC, 20 x 28.....@$11.50
Palm, IX, 20 x 28.....@ 14.00
Empire, IC, 20 x 28.....@12.00
Empire, IX, 20 x 28.....@15.00
Hickory, IC, 20 x 28.....@ 12.50
" IX, 20 x 28.....@ 15.50
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 14.75
" IX, 20 x 28.....@ 17.25

Westmoreland:
IC, 14 x 20..... $6.00
IC, 20 x 28..... 12.00

Elwood:
IC, 20 x 28 ..... $11 50

Kenwood:
IC, 20 x 28.....$11.50

Furmston:
IC, 20 x 28..... ...$11.00

Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50

Illinois, Old Method:
IC, 20 x 28.....$17.00

E. L.:
IC, 20 x 28.....$12.50

Jessie:
IC, 20 x 28.....$12.00

Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20.....$9.50

Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 .....11.00

Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28.....19.00

Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28.....22.00

Neville, Stamped, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28.....12.50
" " IX, 20 x 28.....15.00

Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared).....$9.50

Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared).....19.00

Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)..... 6.25

Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared).....16.50

Columbia, IC, 14 x 20 (Stamped).... 7.25
" IC, 20 x 28 (Stamped).....14.50

Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50

Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28..... 13.00

Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28.....12.50

Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 ..... 12.00

Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
" (Redipped), IC, 20 x 28.....17.00

Old Process:
IC, 14 x 20..... 9.25
IX, 14 x 20.....11.25
IC, 20 x 28.....18.50
IX, 20 x 28.....22.50

H. B. L., Old Style:
IC, 14 x 20..... 7.75
IX, 14 x 20..... 9 25
IC, 20 x 28.....15.50
IX, 20 x 28.....18.50

Sheet Iron—

Black.

Nos.	Common American	Refined.
10 to 16	₩ lb 2 3-10¢	3 1-10¢
17 to 20	₩ lb 2 4-10¢	3 2-10¢
21 to 24	₩ lb 2 5-10¢	3 3-10¢
25 and 26	₩ lb 2 6-10¢	3 4-10¢
27	₩ lb 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ lb A, 10¼¢; B, 9¼¢
dis. 5%
Craig's Polished Sheet Steel.....8¼¢

Galvanized.

Juniata or first quality.....dis.75@5%

Copper—

Ingot.

Lake.....10¼¢ @ 10⅝¢
Casting Brands..... 9¾¢ @ 10⅛¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Disconnt on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$6.35
Plain, ⅝ inch up to ¾ inch	.38
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 lb lots.)

Discount, 40%.

Slab Spelter—

Western Spelter..... .....4¢

Sheet Zinc—

600 lb casks..... .....4.50¢
300 lb casks..... .....4.70¢
Loose sheets..... .....4.80¢

Lead—

Soft Pig Lead.....4 ¢
Bar.....4½¢
Pipe.....6½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12½¢
Hallett's.....11½¢

Wrought-Iron Pipe—

1¼ and under, Plain	57½%
1¼ and under, Galv	50%
1½ and over, Plain	67½%
1½ and over, Galv	57½%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ lb, 2 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, B. Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Brown	₩ lb, 5½¢
" Ground in oil, Purple	₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls	54¢
Linseed Oil, Raw, in bbls	51¢
Mineral Paints	2@4¢
Orange Mineral	9¼¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	5@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¼¢; kegs	7¼¢
Sipe's Japan Oil, in bbls, ₩ gal	31¢
Spirits Turpentine, in bbls., ₩ gal	36¢
Asphaltum, Trinidad Refined, ₩ ton	$45
Tarred Felt, 1 Ply, ₩ 100 lb	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.75
Roofing Pitch, lb bbl. of 300 lb	$3.00

NEW YORK, JUNE 8, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:
Small lots.....₩ lb, 65¢
100-lb lots.....₩ lb, 63¢
Ton lots.....₩ lb, 60¢
No. 1 Alum'num (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....₩ lb, 63¢
100-lb lots.....₩ lb, 60¢
Ton lots.....₩ lb, 55¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....₩ lb, 60¢
100-lb lots.....₩ lb, 55¢
Ton lots.....₩ lb, 50¢

Antimony—

Cookson.....₩ lb, 10½¢
Hallett's.....₩ lb, 10 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per lb.	
¾ in. up to 2-in	$0.35	25 @ 30%
⅝-in. up to ¾-in	.36	
½-in. up to ⅝ in	.38	
⅜-in. up to ½-in	.41	
5-16-in. up to ⅜ in	.48	
¼-in. up to 5-16-in	.65	
3-16-in. up to ¼ in	1.00	
⅛-in. up to 3-16-in	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger	Special	
2½ in. to 3 in., to No. 16, inclusive,	.28	

Copper and Bronze Tubing—3¢ ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square*—
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ₩ lb, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10 ¢
Ausonia Grade Casting.....9½¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.				
4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20%

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

Nos.	Common American.	R. G. Cleaned American.
10 to 16	₩ lb, 2.50	2.80¢
Nos. 17 to 21	₩ lb. 2.60	2.90¢
Nos. 22 to 24	₩ lb, 2.70	3.00¢
Nos. 25 and 26	₩ lb. 2.80	3.10¢
No. 27	₩ lb, 2.90	3.20¢
No. 28	₩ lb, 3.00	3.30¢
American B. B.	₩ lb, 4¢@4¼¢	

Russia, Planished, &c.

Genuine Russia, according to assortment....₩ lb, 11¾@12¾¢
Patent Planished....₩ lb, A, 10¢; B, 9¢ 5%
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

	B. B.	
Nos. 16 to 16		75@75&5%
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Lead—

American Pig.....3¾¢@4¢
Bar.....4½¢
Pipe.....6½¢, 20%

Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....87½¢, 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2½¢ ₩ lb.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil:	
Raw, ₩ gal	.@ .56
Boiled	.@ .53
Spirits Turpentine:	
In bbls	.@ .36½
Putty:	
In barrels and ½ bbls	.01½ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01¾ @ .02¼
In bladders	.01¾ @ .02¼

Roofing Material, &c.:

Asphaltum, Trinidad Refined, ₩ ton	$30.00@$35.00
Asphaltum, Rock, ₩ ton	$14.00
Coal Tar Felt, 1 Ply, ₩ lb	2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft.	$1.85
Roofing Pitch, ₩ bbl	$2.25

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, June 16, 1894.

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Vagaries of Weather.

A subject in which everybody is interested, without distinction of station or occupation, is *the weather*. Upon this, each day, all persons make some reflection. Like food, it is a fundamental factor of human existence, for even the supply of food is largely dependent upon its conditions. Thus it is that the weather reports and predictions now form an important and staple item of daily news. The uncertainties and vagaries of weather have become proverbial. Yet there is nothing more sure than that all its varieties, of which this country has had a rather unusual experience, result from the action of natural laws. As the word "law" implies regularity and uniformity in mode of action, and can mean nothing else, it has puzzled many to understand how such action can result in apparent irregularity. This spring we had first a continued period of dry weather, followed by heavy storms of wind with protracted rainfall, succeeded by late frosts, doing much damage to crops at various points. In these respects the season is regarded as exceptional, yet, in the action of natural laws how can uniformity permit exceptions?

A Puzzling Question Explained.

The answer to the question just put is that in nature all that seems irregular is only so in appearance. If one should trace with a pencil a mark say ½ inch long, making it as irregular as possible, and then exactly reproduce this mark, connecting it with the first, and so on with the third and fourth mark, that which at first seemed entirely irregular will soon appear to obey a law of uniformity. A regular recurrence of anything, considered as part of a whole, establishes a law of repetition. There are many reasons to believe that if observation of weather could be extended over sufficiently long periods a law of repetition could be deduced from systematic records of such observation. If such a law could be established, conditions of weather might be predicted with as great certainty as the return of a comet moving in a regular orbit. But it remains possible that such a law of recurrence, if it exist, may comprise cycles of time so great as to be comparable only with geological periods, lapses of time so vast that human records could not be preserved from their beginning to their termination. If this be true, while it does not conflict with the proposition that a law of uniformity governs weather, like everything else in nature, it implies that the law can never be definitely stated and will forever remain hidden from human intelligence.

The Anarchistic Strikers

Insurrections of more or less magnitude have broken out in 12 States. If they were due to political causes the whole country would be in a ferment. As they are merely demonstrations by striking workingmen, excitement runs high in the immediate localities affected and diminishes rapidly as the distance increases. Yet in nearly all these States it has been found necessary to call out the militia to check the commission of unlawful acts by bodies of men too large to be successfully handled by local authorities. The reports printed in the daily press read like bulletins from battle fields. Bloody engagements take place, lives are sacrificed, property is destroyed and the "horrid front" of war has become a vivid reality in too many places. Strikers defy the law and resort to the most desperate deeds of violence in a mad fury. They seem to have broken loose from all restraints and cannot be controlled by their leaders. These labor officials in their public utterances counsel peaceful methods, but they have evoked a demon who refuses to be confined and mocks their feeble efforts at restraint. In the wide organization of labor unions a new species of government has been formed, which is in direct antagonism to the form of government established by the people, and the conflict now precipitated must decide who shall hereafter be our rulers.

Enforcement of Law.

When the coal miners' strike began the sympathy of the public was overwhelmingly in their favor. The advantages of cheap fuel were scorned when it was found that such cheapness was the result of scanty wages paid to miners. Even coal operators themselves conceded the justice of miners' claims and professed their willingness to advance wages in quite a number of localities if competing operators would do the same. Enough of them at one time were ready to settle the dispute to have given the miners a great victory, which could then probably have been extended over the entire coal country. But the obstinacy of the leaders in refusing partial settlements and demanding a national adjustment changed the whole aspect of affairs. To hasten a coal famine desperate means were adopted by the miners. And now public sympathy has changed. The friends of the miners are deserting them. The press, without regard to politics, demands that the law shall be respected, that the movement of coal trains shall not be interfered with, that coal property shall not be destroyed, that miners who desire to work shall not be molested and that those who are in arms against the constituted authorities shall be treated as rebels. There is no longer any question of high or low wages for miners. The only question to be settled now is whether any body of men are to be permitted to establish a government of force in this land of liberty.

The Fire Island Light, one of the most important beacons on the coast, is about to be improved by the substitution of electricity for oil in its illumination. The new light that is to be installed is said to have the power of 25,000,000 candles. It was exhibited at the World's Fair, where it was known as the "lightning light." It has a bivalve lens. The two sides are about 9 feet in diameter. Each lens is made up of many crystal prisms set in a network of brass, the prisms concentrating the light on a crystal disk in the center. The lighthouse on Fire Island is 168 feet high, and it is estimated that the new light will be seen for 25 miles. It will be the greatest light on the coast of this continent.

In describing the present industrial situation in New England, the Boston *Transcript* says that a number of the mills are now being run not for the profit there is in the business nor simply to keep the men at work, but because the managers find there is a slight difference in expense account between running them at a loss and letting them remain idle. The manager of the Manchester Print Works, for example, believes in running the mills so long as the loss is less than 25 per cent. In other words, the expense of maintenance of idle mills is 25 per cent. of the actual cost of running, and as long as the loss in manufacturing goods falls below this 25 per cent. the mills will be run.

The Massachusetts Legislature has passed a bill authorizing the increase of the stock of the Bell Telephone Company to $50,000,000, with an amendment that the capital stock shall be paid for in cash.

THE LETTER BOX.

Marine Bicycle.

From R. B., *Lynn Valley, Ont.*—I am working on a water bicycle and have been referred to you for information about the valves. I intend having two tin tubes, tapering at both ends like a round bottom boat, with the top flat enough to fasten the boards to, for holding them together. The length of tubes is to be between 8 and 10 feet. The machine, 3 feet 6 inches in width, will be run by two paddle wheels, one ahead and the other in the center. I want the floats to hold from 200 to 225 pounds, to allow for the rider and the fixings. What should be the circumference of the floats?

Answer.—The floating part of the bicycle is in reality a catamaran, and we presume our correspondent expects to have the floats about half submerged. In other words, the two cylinders would then, if submerged half their depth, support the same quantity as one of the cylinders completely submerged. Assuming the length of cylinders to be 10 feet, and not making allowance for the taper of the ends, since we do not know exactly what the shape will be, it remains to find what diameter of cylinder 10 feet in length would hold 225 pounds of water. Consulting the tables, we find that a pipe 8¼ inches in diameter, 1 foot long, contains 23.1 pounds of water, so that a pipe 10 feet long contains 231 pounds of water. According to this figuring, therefore, if our correspondent makes his cylinders 8¼ inches in diameter and 10 feet long they will support 231 pounds when submerged half way. This, it must be remembered, makes no allowance for the weight of the cylinders, but we presume that was figured in the 225 pounds. It further assumes that the ends of the cylinders are square, so that it would be well to make the diameter a trifle larger to allow for the pointing at the end of the cylinders, if we are to assume that 10 feet is the length over all. If our correspondent is interested in figuring it out in another way it can be done in this fashion: A cubic foot of water weighs 62¼ pounds. Therefore he will have to displace 3.61 cubic feet of water to support 225 pounds. That assumes the length of the cylinder to be 10 feet totally submerged. For 1 foot of length, therefore, the cylinder will have to contain 0.361 cubic foot. We don't suppose our correspondent is specially interested in the successive steps of this calculation. Suffice it to say, therefore, that from these figures we deduce that a cylinder should be 8.14 inches in diameter to support the proposed weight. This is a little less than the 8¼ inches above given, but the latter figure, as stated, was for a weight of 231 pounds. We give the second calculation to show how it checked the first. We presume if our correspondent makes his cylinders 8¼ inches in diameter they will prove suitable for his purpose.

Proposed Package for Tin Plates.

From L. B. D., *Spring Hill, N. S.*—I notice in *The Metal Worker* of May 26 a communication from A. L. Burtis, Lockport, N. Y., relating to an improved package for tin plates. The idea of circular package is to my mind an improvement, but I fear that sheet iron for a covering is objectionable for the reason that a blow or fall upon the casing would dent it and leave an impression on the tin, which would thus be damaged. If the sheet iron casings were lined with wood of some light strong quality it would be better; or, why not have boxes similar to cheese boxes or something of that general kind? Then the box might be packed in the same way that zinc is packed in casks, the space being all utilized so that there would be no hollow core. I hope to see Mr. Burtis' plan for improved package carried out.

Steel Furnace Dome.

From R BIGLEY, 96 *Queen street, Toronto, Canada.*—Will *The Metal Worker* give me the address of some manufacturer of steel domes for hot air furnaces? I have looked for advertisements of these goods, but have found none.

Note.—We have given the full address of this correspondent in order that manufacturers of such goods may communicate direct. Hepe, Koven & Co., 18 Spruce street, New York, make a specialty of goods of this character.

Coppersmiths' Tools Wanted.

From JOHN FULLER, SR., *Seneca, Kan.*—Since my articles on coppersmithing appeared in *The Metal Worker*, and their republication in book form, I have received a number of letters from different parts of the country inquiring where the tools illustrated are made or can be bought. I have exhausted all the means at my command endeavoring to supply the information sought, but without success. Now, it would seem there is demand enough for these tools to warrant those manufacturing similar goods to make an effort to supply them, particularly hammers. I had a few brought from England a short time ago for my own use, because I could find none in America, but they were poor things, and not to be compared with those usually found in the old shops I have worked in. We ought to be able to get these things somewhere in America. If this should catch the eye of any one in the trade who can and will kindly give us the address of some maker or dealer in these tools, they would confer a great favor on many readers interested. It would be well, however, to say here that the ordinary method of making and hardening hammers is not suitable or satisfactory for braziers' or coppersmiths' tools. I mention this by way of caution, so that those who might be inclined to make an attempt may avoid failure at the outset and be reasonably successful from the beginning; ordinary tinners' tools, or tools made in the same way, are no use to us.

Boiler Surface and Radiation.

From C. W., *Paterson, N. J.*—Will *The Metal Worker* please inform me how many square feet of radiation can be carried by 1 square foot of heating surface in a horizontal tubular boiler?

Answer.—Our correspondent does not state whether the boiler is to be used for steam or hot water heating, and without more details only an approximation can be given. A conservative estimate that will probably give the desired information is that 1 square foot of boiler surface will carry from 8 to 12 square feet of hot water radiation and from 4 to 6 square feet of steam radiation. As a horizontal tubular boiler is generally considered a good type of boiler for heating, it is quite possible that it would carry the larger amount given.

Problem in Drainage.

From S. H., *Union Hill, N. J.*—In response to the query of "M. J. F." of Minersville, Pa., in *The Metal Worker* of June 9, in regard to the draining of his cellar into a creek, if the creek be a tidal stream I would suggest that he put in a back water valve, which would prevent the water from backing up at high tide and allow it to pass off at low tide. But if the creek be an inland stream, the rise of 2 feet which he mentions would no doubt be caused by the spring freshets and last some time, giving the water a chance to accumulate in the cellar. The valve alone therefore would not do. In that case he might put in an automatic cellar drainer, worked by water pressure, connecting the discharge from same on the further side of the back water valve. This would insure him a dry cellar. He certainly cannot depend on the velocity of the current to siphon out his cellar.

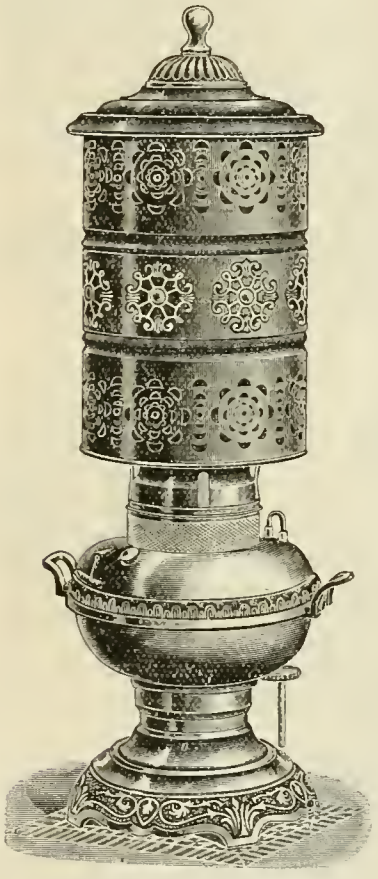
Capacity of Square Cans.

From J. H., *Baltimore, Md.*—Please inform me what size of square tin cans will it take to hold about 100 gallons each? They are to put in a wagon about 4 feet wide, and I would not want them more than 2 feet high.

Answer.—Starting with the basis of 2 feet hight, the size of the cans to hold exactly 100 gallons would be 31.02 inches on the side. Cans 31¼ inches square and 2 feet high will hold 101.4 gallons, which will probably be near enough for our correspondent's purpose.

New Process Oil Heater.

The Standard Lighting Company of Cleveland, Ohio, have placed upon the market a heater known as the New Process, and intended for burning coal oil as a fuel. It is constructed with a brass font, nickel trimmed, and a Russia iron drum with ornamental top, which can be removed in order to use the grate for cooking purposes. The accompanying illustration represents a general view of the heater with the top in position. The manufacturers refer to the



New Process Oil Heater.

construction of parts as simple and as easy to keep clean. The company make use of their Mammoth Globe incandescent lamp with a special attachment on the spreader, which, with the drum, can be readily removed, the spreader changed, a glass chimney placed in position and the heater is at once converted into a 300 candle power Globe incandescent lamp. This heater is intended more especially for use in bedrooms, bathrooms, offices and other places where a moderate heat is required without a flue connection.

The Cowper-Coles Cold Galvanizing Process.

The electro deposition of zinc has been the subject of many patents, but the process was found to be too slow and costly, and the deposit obtained porous. Mr. Cowper-Coles claims that his method of deposition entirely overcomes these difficulties. The engravings, which are from the *Engineer* of London, show the arrangement of a plant recently erected by Watson, Laidlaw & Co., at Glasgow. The articles to be zincked, if thickly coated with grease, are passed through the "potash boil," which is kept at a temperature of about 200° F. by means of a copper steam coil, the solution consisting of 1 pound of American potash to the gallon of water. The articles are then placed in the pickling tank, which contains a weak solution of sulphuric acid and water, kept circulating by a steam jacketed pipe outside the tank, as shown on the plan. The articles are then placed in the washing tank and allowed to remain there until they are required for zincking.

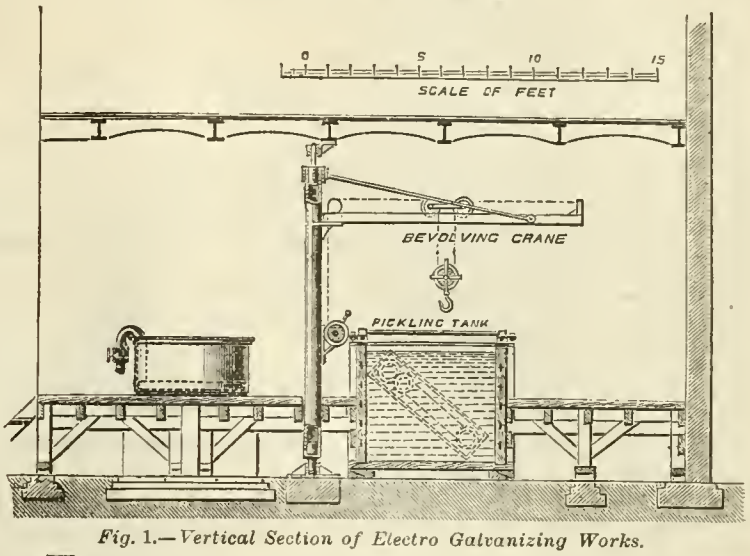


Fig. 1.—Vertical Section of Electro Galvanizing Works.

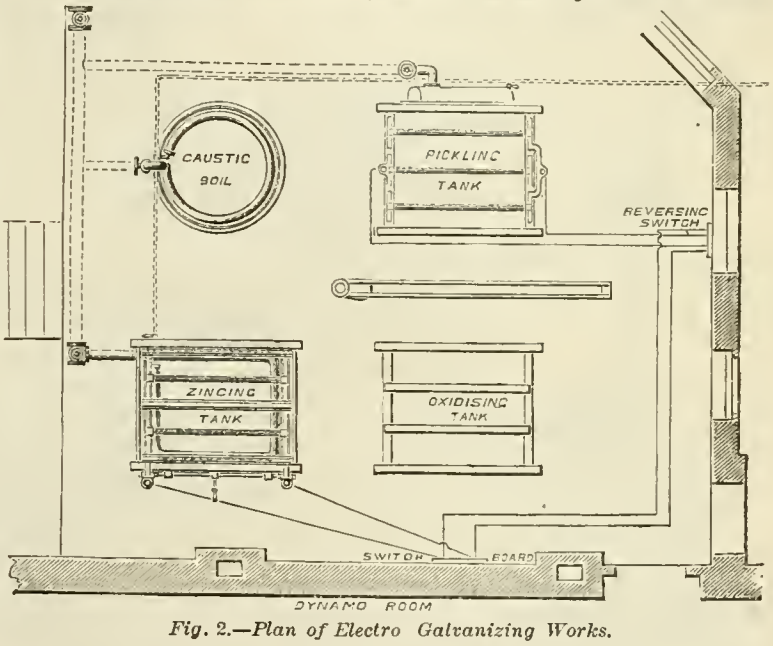
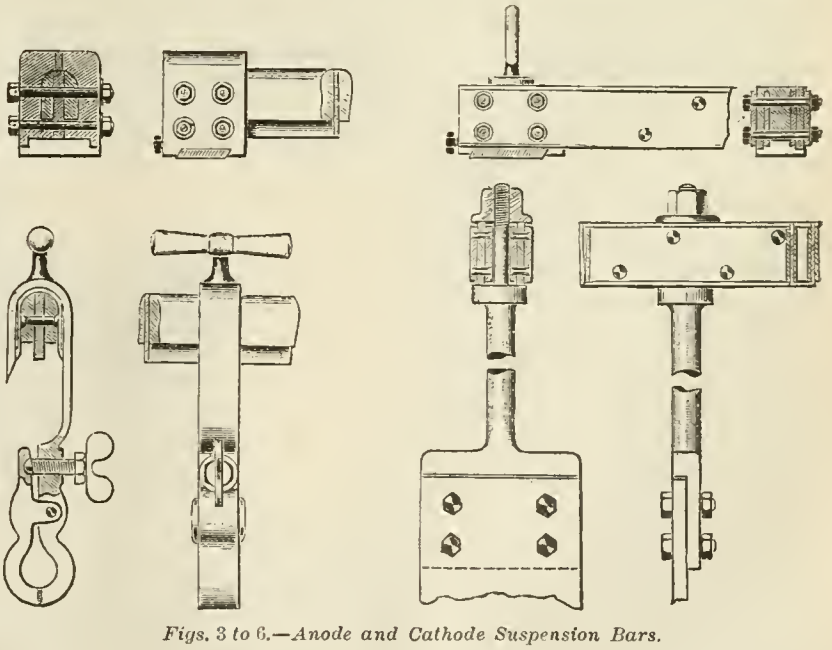


Fig. 2.—Plan of Electro Galvanizing Works.



Figs. 3 to 6.—Anode and Cathode Suspension Bars.

THE COWPER-COLES COLD GALVANIZING PROCESS.

Figs. 3 to 6 illustrate the arrangements of the anode and cathode suspension bars, which are designed to carry 800 ampères each, the total output of

the dynamo being 2500 at 5 volts. A current density of 50 ampères per square foot is employed at the electrodes. The current is conveyed from the dynamo to the zincking bath by two cotton covered cables, having a total sectional area of 2½ inches. Each cable contains 16,800 No. 33 S.W.G. wires made up into 20 strands. The cathodes —that is, the articles being zincked—are suspended on compound copper and steel suspension bars, which rest on a rocking frame to which is imparted a horizontal and vertical motion by means of a hand lever and roller paths, as shown below; the roller paths have a rise of 1 inch in 3 inches. The structure of the compound conductor suspending bars is shown clearly in Figs. 3 to 6 above, and the arrangements for connecting up and for limiting the rocking are shown below. One of the special features of Cowper-Coles' process is the addition of zinc fume or powder to the electrolyte. The zinc dust is readily kept in suspension, as the solution employed is very dense. The addition of the zinc fume enables more than the theoretical deposit to be obtained under favorable conditions, and overcomes almost all the difficulties appertaining to the electro deposition of zinc. The zinc powder employed is obtained direct by the process of distillation from the ore.

The thickness of the zinc cost, says *Industries* of London, applied by dipping the articles to be galvanized in a bath of molten zinc can be varied only within very narrow limits, except in the case of thin plates, which can have the excess of zinc squeezed off by rollers when leaving the bath. The cold galvanizing process allows of the thickness of zinc coat being readily varied from a few grains per square foot to 1½ ounces, which is a matter of some importance, as for many classes of work it is not desirable to have more than ½ ounce of zinc to the square foot. Another advantage of the cold process is that a much smoother surface and a more equal distribution of the zinc is obtained than is possible by the ordinary hot galvanizing. This renders the new process especially suitable for coating the plates of the hulls of fast vessels, such as torpedo boat destroyers. As pointed out by Sir Gabriel Stokes, in addition to the element of resistance depending on the formation of waves continually propagated away from the ship, there is the effect of retardation due to the roughness of a ship's bottom out of all proportions to the mere increase of virtual dimensions, which is explained by the consideration that the little roughnesses form the birthplace of eddies.

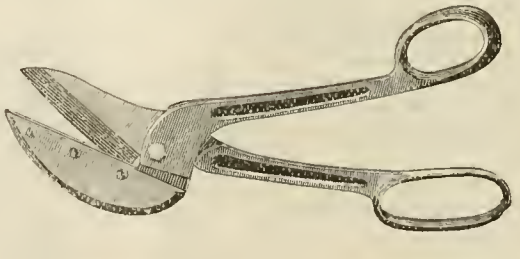
The time in the zinc plating bath is as follows :

Table of Time.

Weight of zinc required.		Thickness of coating.	Time of immersion in bath.
Per superficial foot.	Per superficial yard.		
Ounces.	Ounces.	Inch.	Minutes.
½	4½	0.000861	5
¾	6¾	0.001291	7
1	9	0.001722	8
1¼	11¼	0.002152	10
1½	13½	0.002583	13
1¾	15¾	0.003013	17
2	18	0.003444	20

The Lobl Tinners' Shears.

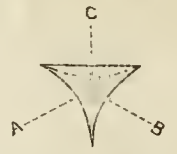
We show in the accompanying illustration a general view of the Lobl shears, a tool intended for roofers, tinners, cornice makers, &c., and made by Eugene Kulinski & Co., 91-93 Thompson street, New York. The peculiar shape of the blades will be noticed, and the special feature of the shears is the method of pivoting them, so that a slot permits the metal to be run straight back as it is cut, and thus the metal does not require straightening after cutting. It is further pointed out that these shears will cut corner shaped strips or leaders, &c., of metal as heavy as No. 24 iron or soft steel. The shears are made of steel throughout, with removable blades, so that they are easily sharpened. The Lobl shears are made in two sizes, No. 14 being 14 inches long, with jaws 4 inches in length, and weighs 2 pounds. No. 2 is 15½ inches long, 4½-inch jaws and 2½ pounds in weight.



The Lobl Tinners' Shears.

Molders' Leather Fillet.

The engraving here presented represents a new form of leather fillet made by the Diamond Clamp & Flask Works of Richmond, Ind. The sides of A B are cut curving, as shown, instead of straight. When the point at the intersection of the lines A B is forced into a square corner the side C assumes a curve, as indicated by the dotted line. This construction saves the time of cutting and preserves the surface of the leather, the exposed side C being the hair side.



Molders' Leather Fillet.

Because some imported Italian marble mantelpieces had been received for the new mansion of Elbridge T. Gerry in this city, all the workmen employed in the building, including plasterers, carpenters, plumbers, tile layers, electric wire men and iron workers, quit work recently, by order of the Building Trades Union. The unreasonable tyranny of organized labor was never more strikingly exemplified. More than $10,000 have been already paid to American workmen employed on the building for interior decorations alone. The union puts its case on the ground of objection to "the use of the products of foreign labor," and the Gerry house has been selected as a test case.

The New York and New Jersey Bridge bill was signed by the President on June 8.

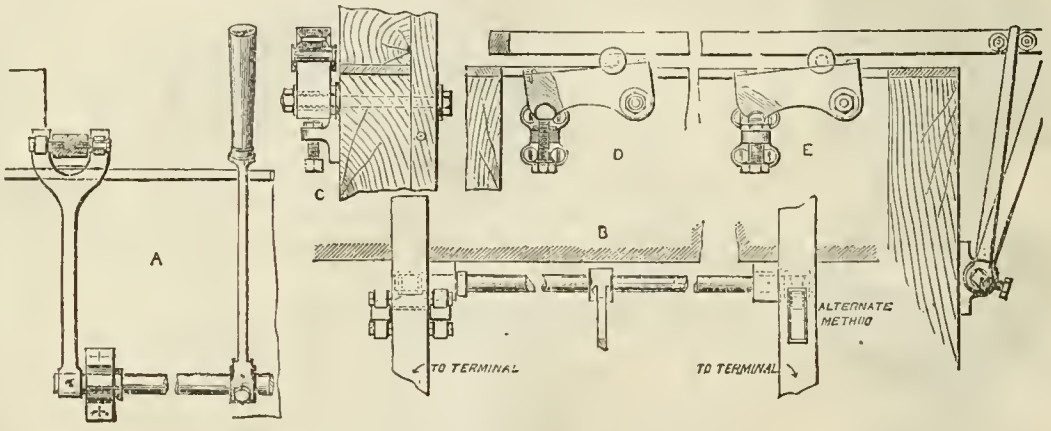


Fig. 7.—Cathode Bar Suspenders and Rocking Frame.

THE COWPER-COLES COLD GALVANIZING PROCESS.

THE RETAIL STORE.

The Dempsey Cutlery Display Case.

The Union Show Case Company, 167 and 169 Randolph street, Chicago, Ill., are manufacturing and placing on the market the Dempsey patent cutlery display cases. These cases contain many features which are unique, novel and withal intensely practical, as shown in the accompanying cuts. The design of the case, the inventor states, is to furnish the trade with a case that meets all requirements with no disadvantages. As seen in Fig. 1, pocket knives to be displayed are arranged in parallel corrugations at an angle of 30° and in three separate horizontal tiers rising one above the other. The larger patterns occupy the base or lower tier, while the smaller and more expensive are placed in the second and third tiers. Rising above the third tier at an angle of 10° and running parallel with the lower tiers is a board for razors, shears or scissors. The background is of blue, red, green or old gold plush. To add still further to the embellishments as well as conveniences, below each tier of patterns displayed and running horizontally is a strip of burnished and lacquered brass, perforated in such a manner as to hold tags on which are printed the number and price of the article immediately above. These price tags are easily detached and can be quickly changed so as to meet all the conditions of the trade. By means of these tags the attention of the purchaser is called not only to an array of glittering blades and handles in a general way, but his attention is directed to individual and particular patterns. They also enable cutlery to be easily marked without marring or soiling.

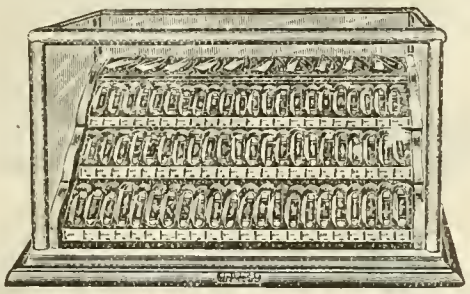


Fig. 1.—The Dempsey Cutlery Display Case.

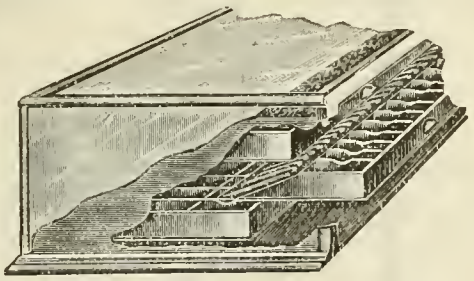


Fig. 2.—Sectional View of the Dempsey Case.

The internal construction of the case will be understood by reference to Fig. 2, which gives a sectional view. Each display tier has compartments for stock which are concealed from view in front, but can be drawn out in the rear like a drawer. By this arrangement the capacity of the case is exactly double that of an ordinary show case. A case 30 inches long carries the stock and displays 66 patterns of pocket knives and one dozen patterns of razors, shears or scissors. The display boards, as seen on the front of the case in Fig. 1, are detachable and may be placed on top of the counter or show case, as shown in Fig. 3, for the closer inspection of the customer. When stock is low, by placing two or more of each kind of knives on the display rack the stock can be made to appear to the purchaser to be quite large, while, on the other hand, if the stock is very large and the dealer is crowded for space it can be contracted by displaying only one of each pattern. Another feature of this case which recommends it to the trade is the fact that it is practically impossible for careless clerks to disarrange the display, or for it ever to appear otherwise than in the best possible condition. Although this case was only patented October 3, 1893, it has been adopted by leading jobbers of cutlery throughout the entire country.

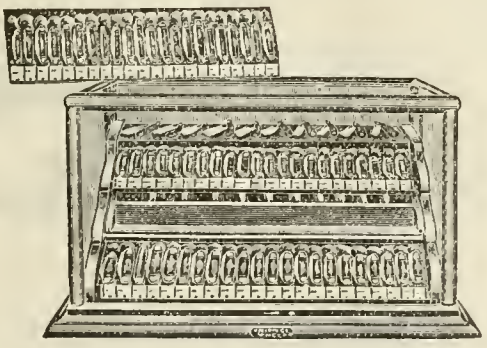
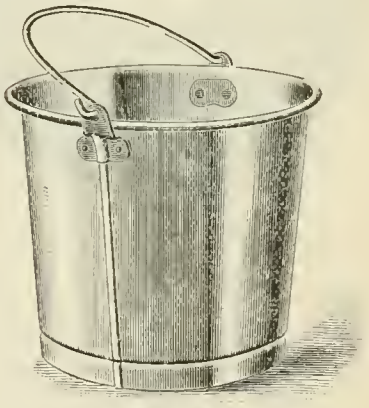


Fig. 3.—Detachable Display Boards.

A New Dairy Pail.

We show in the accompanying illustrations a general view, Fig. 1, of a new dairy pail brought out by the Rochester Stamping Works, Rochester, N. Y.; also, Fig. 2, section through bale ear. The patented feature of the pail is the reinforcement of the ear, as shown in Fig. 2, which consists of a small piece of tin set into a countersink on the inside of the pail directly behind the ear, and all firmly riveted together and securely soldered on the inside, making in



New Dairy Pail.—Fig. 1.—General View of Pail.

Fig. 2.—Section through Ear.

this way an extra strong attachment, perfectly water tight. It is furthermore pointed out that it is impossible for the rivets to work loose or rust out. The patent covering this feature was granted to M. F. Robeson May 15 of this year. The special points of superiority claimed for this pail by the manufacturers are extra heavy wire around the top edge, heavy ears of steel and reinforcement of the ears by extra piece of metal countersunk as described. We understand that these goods are meeting with much success with the trade.

The Ideal Damper.

Stover Mfg. Company, Freeport, Ill., have just taken up the manufacture of dampers, and are introducing the one

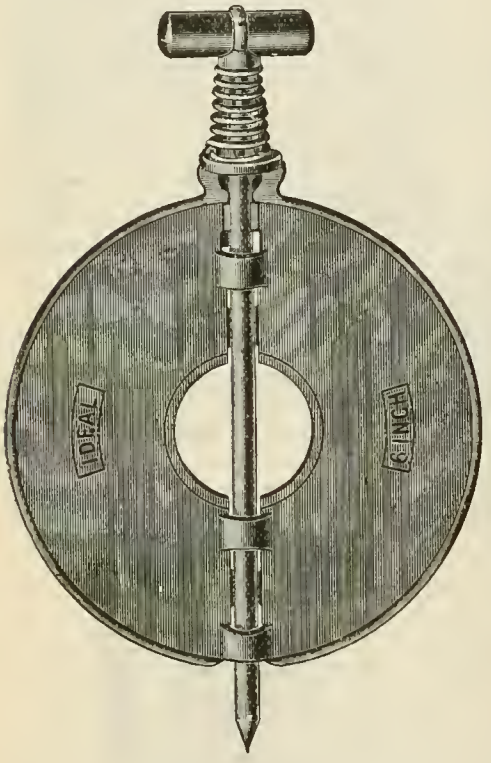


Fig. 1.—The Ideal Damper.

Fig. 2.—Damper Spindle.

shown in the accompanying cut. It is explained that the spindle goes in straight, having proper guides, so that it cannot go wrong, and that with a quarter turn it is in place; that the collar is secured to lugs on the spindle, so it cannot slide off when the spindle is taken from the blade, thus saving much annoyance, and that the wooden handle is securely held in place by means of a wire wrapped around the center in a groove, one end of the wire being cast into the head of the spindle, thus becoming a part of it. The point is made that there is a small amount of metal about the handle, and that the handle is securely held and is kept cool. The makers claim that the spindle is sharp pointed and makes its own hole; that the spring and collar are securely attached to the spindle; that no punch or tools are required to put it in place; that it requires but a quarter turn of the spindle to lock or unlock it; that the spindle enters the blade with the handle turned either way, and that the locking lugs on the spindle are sharp and cut their way through the pipe. The dampers are made in regular sizes from 4 to 7 inches.

Great American Fish Scaler.

Covert's Saddlery Works, Farmer, N. Y., are offering a fish scaler, as shown herewith. The scaler is made of heavy

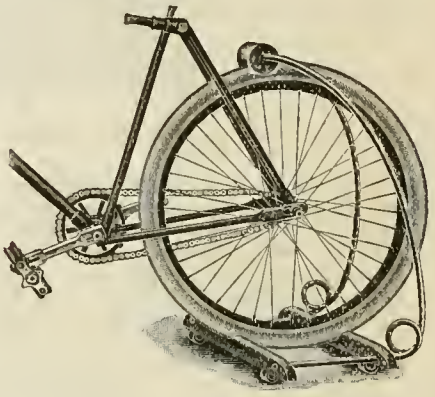
Great American Fish Scaler.

sheet steel, attached to a steel shank, and is nicely finished by being C plated with a non-corrosive metal; it weighs about 3 ounces. The point is made that the rapidity and ease with which scales can be removed with the tool make it a very desirable device for the fish market and the family. Samples are sent by the makers by mail upon receipt of 15 cents.

THE JOHN TOBIN MFG. COMPANY, Newark, N. J., are just sending out a 56-page catalogue the front cover of which proclaims them as manufacturers of nickeled and copper urns, planished tin, copper and nickel plated tea and coffee pots, spun goods and sheet metal specialties. A note to the trade states "we are direct producers of every article in this list" and that "several new and useful articles have been added to our assortment." Several pages are devoted to urns, which are made either porcelain or tin lined and in various sizes and shapes or to special order. These are followed by planished soup tureens, farina and rice boilers, tea kettles, chafing dishes and nickeled and copper beer and ale measures, funnels and mixers. Then several pages are devoted to coffee and tea pots and urns, among which are the Best, with textile filter; the Aroma, Superior and Boss, and Boss urns. These are followed by butter kettles, jelly molds, saucepans, dippers, coffee flasks, gravy strainers and brass, copper, tin and zinc oilers. They also make a line of trimmings, breasts, covers, handles and spouts of tin and copper for tea and coffee pots, and a line of animal, leaf and other cake and biscuit cutters.

The Bridgeport Bicycle Stand.

Lyon & Grumman, Bridgeport, Conn., are putting on the market a bicycle stand, as here shown. The device consists of two cross bars of wood, which may lie flat on the floor or be mounted on casters, through which run ⅜-inch steel wire. This is coiled to form a spring and then carried up to the hight of the bicycle wheel and across and down on the other side. The bottom of the wheel rests in grooves in the wood cross pieces and the top is held by a grooved spool through which the wire runs. This arrangement, it is stated, holds the bicycle upright and firm even when mounted, and permits



The Bridgeport Bicycle Stand.

easy movement of the machine either together with the stand or alone. The manufacturers claim that the stand is simple in construction, manufactured in the best manner and that it weighs but 4 pounds.

Improved Sad Iron Handle.

The Cleveland Wood Turning Company, 710 to 726 Scranton avenue, Cleveland, Ohio, are manufacturing an improved Mrs. Potts' sad iron handle. The improvement relates to the metallic part of the handle which is called the stretcher. This is now made of steel, nickel plated or tinned, instead of cast iron. It combines lightness and strength without the breakage attend-

Improved Sad Iron Handle.

ing the iron stretcher handles. The ends of the stretcher are turned up, as shown in the illustration herewith, for the same reason that the iron stretcher has hollow lugs at each end—namely, to keep the screw heads as far as possible from the hot iron, and thus avoid unduly scorching or burning the wood. The wooden circles used in the manufacture of these handles are of exactly the same dimensions as used on the regularly made handles, but are only of hazel.

PLUMBING and GAS FITTING.

Illinois State Convention.

The first annual convention of the Illinois Master Plumbers' Association was held in Peoria June 7. W. T. Geary of Chicago, State vice-president of the National Association, opened the meeting. An address of welcome was delivered by Mayor Miles. The following officers appointed at the May session in Chicago were in attendance: Robert Loudon, president, Bloomington; W. T. Geary, vice-president, Chicago; J. R. Scanlon, treasurer, Elgin; B. B. Breen, secretary, Chicago. Executive Committee: Robert Loudon, Bloomington; J. R. Scanlon, Elgin; W. E. Goodman, South Evanston; William H. Durham, Rockford; David Whiteford, Chicago; T. P. Cullon, Chicago; P. Sanders, Chicago; W. T. Geary, Chicago; A. W. Murray, Chicago. The purpose of the meeting was to form a more perfect organization for the advancement of the plumbing business of the State and to procure, if possible, proper legislation leading to more perfect sanitary plumbing and a better class of work throughout the State. The association proposes to do this and asks for the appointment of inspectors for towns having water and sewerage systems and if possible for the examination by a competent board of applicants for plumbing licenses.

Entertainment at Detroit.

The Master Plumbers' Association of Detroit, Mich., held a meeting at the Builders and Traders' Exchange rooms last week, at which the programme for the annual convention of the National Master Plumbers' Association was adopted. The convention will be held in Detroit on Tuesday, Wednesday and Thursday, June 19, 20 and 21, and between 500 and 600 delegates, including the members of the local association, will attend.

There are 60 members in the city who, together with the delegates from the State, will form the Michigan delegation of about 100 men. They will meet at the Builders and Traders' Exchange on Tuesday, June 19, at 9 a.m. All will wear a uniform consisting of white Fedora hats, black suits and canes. Headed by a band, they will march to the Hotel Cadillac, where all the delegates from outside of the State will be assembled, having been escorted thither from the depots and other hotels by a committee.

Colonel McGurrin of Grand Rapids, chief marshal, and Colonel Wheeler of Kalamazoo, his aide, will take charge of the parade, which will move as follows: From the Cadillac Hotel down Michigan avenue to Woodward avenue, around the Campus Martius, back to Michigan avenue, and up Lafayette avenue to Philharmonic Hall, where the business session will be held.

Tuesday night the delegates will be given a moonlight excursion up and down the river on the new steamer "Pleasure."

While the delegates talk business on Wednesday afternoon, the lady guests will be given a ride around the city. At 4 p.m. all the gentlemen and ladies will be taken to Alexander's, above Walkerville, by steamer. After supper they will be given a short ride on the river and then return to the city.

The business sessions will close some time on Thursday evening. During the afternoon the lady visitors will be given another carriage ride around the city and to Belle Isle. On Friday morning at 8 o'clock the steamer "Pleasure" will leave the foot of Woodward avenue with all the delegates and their ladies on board and steam up to the Oakland on the St. Clair River, where dinner will be served. The party will return to Detroit at 6 p m.

James H. Crumley is president and Thomas F. Morris secretary of the local association. The entire association constitutes the Reception Committee, of which George Lane is chairman. The Committee of Arrangements consists of James Meathe, president of the State association; James W. Partlan and Benjamin Guiney. Benjamin F. Guiney will act as general utility man.

The Plumber of To-day.

The following is the address made by Zalmon Goodsell at the banquet tendered by S. E. Dibble to the New Haven, Conn., Master Plumbers' Association on retiring from the presidency:

During the past six years, a new order of things has come to pass. We formerly found that competition with the manufacturer and wholesale dealer was an impossibility; combination and organization were necessary before our just claims would be considered or listened to. The call was responded to by members of our trade joining from all over the country. The sequel has been wonderful in its far reaching results. To day, after six years of labor, we have local and State organizations everywhere. We have rights granted that we never dreamed of or dared ask for before. To-day, instead of botchy and slighted work being common, it is very uncommon Better work is done, more care is taken. The honor of our association is at stake. No member wants the reputation of doing an injury to his neighbor or to himself. To-day the industrious and ambitious plumber and apprentice are striving to be better educated and better acquainted with their adopted profession, hoping some day they may be able to have a business of their own and be competent to take charge of the same.

To day we are expected to know all about hydraulics, boilers, engines, pumps and connections and their uses; about gas fitting, steam heating, furnaces, stoves, tinning, drafting, shop work, sanitation, ventilation, drainage and many other branches of knowledge that enter into the construction of a building, from the smallest cottage to the largest edifice. To day there are thousands of goods of different varieties and sizes, of every conceivable shape manufactured for our use, giving employment and support to hundreds and thousands of men all over the country. How many of these working people would be homeless and in want if it were not for the thrift and enterprise of the plumbing trade that keeps them employed? To-day the different trades in unison, by furnishing employment to the skilled mechanic and the laboring people, enable them to build their homes, support and raise their families in comfort. This increases the population and wealth of all towns and cities. This fact proves that the trades lay the foundations of progress for all municipalities. To day we must for the good of our cause go forward, not backward. Our status will be made stronger; then new impulses will secure desired legislation for the protection of human life and more perfect work. Can we trust this duty to strangers that are not educated in our trades, or shall we by organization and devotion to our needs spare a part of our own time from business pursuits to certain public duties?

To day our trade does not hear the expressions and receive the unseemly ridicule from others nearly so much as formerly. We are deserving of more respect, and why should not this be so? None but the brightest minds can ever hope to half understand the large variety of knowledge and skill required to make a good workman and a competent master. Our practical experience, instead of theoretical, gained by years of time and application, demands superior intelligence to learn the trade's intricate requirements. To-day we are the equal of any profession. We hear words of wisdom at our different gatherings, of prominent members who a few years since did not know the latent powers of thought and speech they were endowed with, until the opportunity arose that developed their minds. Knowledge of our work is never ending, it will be continuous as long as the genius of man exists. To-day we have good fellowship and harmony among the craft instead of dickerings, bickerings and jealousy. We meet with one common interest, knowing by all experience that what benefits one member benefits all alike. To-day, would any member dare place himself on record as desiring to have the leaves in our book of progress torn out and go back to the old methods, of every man for himself, when the combined intellect of our members has brought forth so many new and needed inventions for the convenience and health of the people?

For six years we have been talking and telling over the same old story, of our hopes and fears, of our ambitions, singly and collectively, of how near to accomplishment we have come to their realization. To some this may seem dull music; still we should be more than willing to bear up under the old strains, as all objects desired are gained by persistency, and perfectness by continued repetition and practice. We cannot bring forth new thoughts and ideas without re-examinations of the old familiar ones. We each have our mission in life to fill, every one in his own peculiar sphere. Some will by

their energy make their years spent upon earth of great benefit to mankind, by being broad minded, charitable and helpful to their fellow beings. Others may come and go having gained a bare subsistence. They live in an atmosphere of egotism and small surroundings. They may have done some good and more of evil. These constitute a large majority of the atoms of humanity among the millions that inhabit this earth. We pray the time may come when every human being will be counted on the side of well doing. Let every person try to do one thing perfectly, have some object in life before death comes. A record of success in life's struggles lives after you are gone, and you will not have lived in vain.

Gas and Gas Fitting.—I.*

BY J. W. HUGHES.

Introductory.

It is my intention to write, under the title "Gas and Gas Fitting," a series of articles for *The Metal Worker* suitable to the requirements and understanding of the ordinary reader. It is my special desire to make the articles of use to those who may be called upon, from time to time, to execute in a practical way such work as may come to hand in the usual course of a small plumbing and gas fitting business conducted in a large city, or in the general tinsmithing, plumbing and gas fitting shop of the smaller towns. Little that is new will be advanced, and anything in the way of the higher science of the subject will be avoided. The first, because anything new on the subject of ordinary illuminating gas, speaking in a general way, is exceedingly hard to find; and secondly, because the higher scientific side of the question would, I take it, be of little practical interest to my readers. My authorities will be the encyclopedias, mechanical dictionaries and facts gleaned from writers of authority, supplemented by information gathered from practical gas fitters, whose life work has been the fitting up of the various pipes and fixtures. Finally, such knowledge on the subject as some 30 years' general practice in the art has given me, is at the disposal of the reader, provided I have the skill to put it within his reach.

When the ordinary person hears gas spoken of the conclusion is immediately come to that lighting gas is the subject under discussion. But the word "gas" covers a larger field. An old dictionary explains the word as follows: "Gas—a spirit not capable of being coagulated, the essential spirit into which all matter is resolvable; an inflammable vapor, which is obtainable from combustibles, and is used for lighting up; also obtainable by decomposition for all things, more or less." Rather a quaint definition, but in the main correct enough to suit the present purpose. The "obtainable from combustiblea" and "is used for lighting up" (part of the above quotation) is what is of particular interest in the present case. Such a person will also have in his mind the idea that gas is quite a modern discovery or invention. He is aware that the grandfathers of the present generation of mature years used whale oil and tallow candles when they did any lighting up. But there is nothing new under the sun, and natural gas has been used from remote times in China, Central Asia and near the Caspian Sea for purposes of heating, lighting and manufacture. It is undoubtedly true, furthermore, that the sacred and perpetual fires that received the adoration and worship of that very ancient religious sect, the Fire Worshippers, were gas fires fed by natural gas issuing from fissures in the earth.

The general introduction of gas as a lighting material is undoubtedly of modern origin. About 1786 Earl Dundonald made experiments on gas lighting at Culross Abbey, his search, however, not being for light but for the tar that resulted from the distillation of coal. The gas in the noble Earl's works was a by-product, being regarded as a very interesting curiosity. In modern gas works it is the gas that is sought for (the tar being one of the by-products), although the by-products of an up-to-date gas plant, consisting of coke, tar, ammonia, analine dyes, &c., &c., are more valuable than the gas. In fact, I have authority for saying that though not a foot of gas was used for ordinary lighting and heating purposes, the distillation of coal would still be a very profitable industry.

In 1792 William Murdock lighted his shop at Redruth, Cornwall, with coal gas. He afterward fitted up a more extensive plant near Birmingham, England, for lighting the workshops of the celebrated firm of Boulton & Watt, engine builders, and about 1803 he fitted up several cotton mills in Manchester. To him is generally given the credit of being the discoverer and introducer in a practical way of modern gas lighting, and not without right. However, as far back as 1667 the "Transactions" of the Royal Society gave an account of a burning spring in one of the coal districts of England, and alluded to the fact that Thomas Shirley traced its source to gas escaping from the underlying coal beds. It is not necessary to go further into the history of gas, but it is to be hoped that enough has been put before the reader to awaken an interest in the subject and prompt the reading necessary to fuller information.

Coal gas, which is most commonly and generally used through the world for lighting, heating and cooking, is obtained by a simple process of distillation, bituminous coals being selected as most likely to give the best results, although cannel coal holds a high place in the opinion of gas engineers.

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Banqueted by S. E. Dibble.

At the eleventh annual meeting of the Master Plumbers' Association of New Haven, Conn., after the report of the president, S. E. Dibble, which was the feature of the meeting, the following officers were elected. In spite of the efforts of the members to the contrary, Mr. Dibble insisted on the election of some other president, he having served four years. The officers for the ensuing year are: President, Franklin A. Curtiss; first vice-president, Edward A. Rourke; second vice president, Andrew J. Clerkin; recording and financial secretary, James M. English; corresponding secretary, F. A. Carleton; treasurer, W. H. Hazel; sergeant-at-arms, T. W. Corbett.

The delegates to the national convention at Detroit are: President Curtiss, A. J. Clerkin and S. E. Dibble.

The meeting adjourned to a banquet tendered by Mr. Dibble, served at the Republican League House, to which several guests from out of the city were invited. At a handsomely decorated table, with music by an orchestra, the following *menu* received universal attention:

Clams on Half Shell,
Sherry.
Consommé Puritanière,
Boiled Halibut, Hollandaise Sauce,
Sauterne.
Parisienne Potatoes,
Sliced Cucumbers,
Roast Spring Lamb, Mint Sauce,
Champagne.
Peas, Potatoes, Asparagus,
Lettuce, Tomatoes,
Chicken Salad.
Ice Cream
Assorted Cakes, Crackers and Cheese,
Fruit, Coffee, Cigars.

When the cigars made their appearance and the clouds of smoke put every one in a good humor, Mr. Dibble rose, but before he had time to speak A. J. Clerkin surprised him by the presentation of a magnificent gold watch chain with a diamond studded locket inscribed as follows: "Presented to S. E. Dibble, President, by the Members of the New Haven Association of Master Plumbers, June 5, 1894." Mr. Clerkin prefaced the gift by a few well worded remarks, paying a fitting tribute to Mr. Dibble's long and faithful tenure of office.

Mr. Dibble was taken completely by surprise, but thanked the association in a heartfelt manner. Among the other speakers were Jas. Ahern, J. B. Weiant, C. S. Eames, Zalmon Goodsell, who was introduced as the plumbers' candidate for Governor; John S. Craig and Robert Morgan. Elmore Dibble, the son of the host, gave a violin solo, and James Ahern sang "The Sword of Bunker Hill" as only he can sing it. Plumbing Inspector John D. Eldridge and Fire Commissioner W. H. MacDonald also made short addresses, when the gathering dispersed with pleasant thoughts of Mr. Dibble as an official and a host.

The following were present at the banquet: James Ahern of Hartford; A. J. Clerkin, J. B. Weiant of New Britain; John S. Craig of Hartford, and C. S. Eames of Bridgeport, officers of the State Association of Master Plumbers; Zalmon Goodsell of Bridgeport; S. W. Damon of New Britain; Robert Morgan, F. A. Curtiss, J. Newton Pierpont, J. H. Buckley, W. H. Hazel, F. A. Carleton, J. D Eldridge, James E. Howland, Edw. A. Rourke, Thos. P. Rourke, Wm. Keane, T. W. Corbett, Jas. M. English, Wm. H. MacDonald, T. A. Potter, Thos. Gunning, D. E. McNamara, E. N. Botsford, A. B. Sproul, W. F. Redfield and Willard C. Warren.

TRAPS AND VENTS.

AT THE FINAL MEETING of the delegation from the New York City Association of Master Plumbers to the national convention at Detroit, it was unanimously resolved "to present the name of and support Vice-President Mitchell of New York as our candidate for president of the National Association for the coming year." The meeting was well attended, 28 out of the 37 delegates being present. In reference to the matter of his nomination, Mr. Mitchell said: "Should the association confer on me the honor of the presidency I shall endeavor to advance its standard for usefulness in the interest of all; should some other man receive the honor, I shall congratulate him and feel that I have been relieved of a great responsibility and will render him such assistance as is due from a loyal member." Mr. Mitchell has always been an active man in the affairs of the association, and his work during the past year

has reflected much credit upon his executive ability and untiring energy in forwarding the interests of the master plumbers.

The Master Plumbers' Association of Lynn, Mass., organized through the influence of National President Daniel G. Finnerty, is composed of the following members: L. A. May Company, F. R. Niles & Co., Geo. E. Sleeper & Co., John F. Morgan & Son, John Hunt, John H. Pension, Joseph McGilvary, M. B. McLaughlin, Jas. R. Hughes, Pote & Upton, Talbot & Co., Harnwer & Quimby, Myles F. Moran, T. B. Reardon, W. I. Wiley, Jas. H. Curry, W. E. Lewis, Jas. F. Ryan, John Gard, R D. Potter. They have affiliated with the National Association and have elected the following officers: President, J. F. Morgan; secretary, Edward M. Russell; treasurer, J. C. Donnelly.

It is gratifying to know the strict way in which the law concerning unlicensed master plumbers is being enforced in this city. We have already called attention to instances of fines for violations of it, and this week another plumber without a license was fined $25 in the Court of Special Sessions for doing an overhauling job.

Through the kindness of the president of the National Association of Master Plumbers, Daniel G. Finnerty of Boston, we are in possession of a copy of the law recently passed in Massachusetts relative to the licensing of plumbers and the supervision of the business of plumbing.

J. W. Petry & Co. are a new firm in the plumbing and heating business at Fourth and Verona streets, Long Island City, N. Y.

A sarcastic writer in one of the Albany, N. Y., daily papers asks: "Can any one tell me why all plumbers use for a sign a water closet bowl? It certainly is not a pleasant object to see stuck in two or three windows, or worse yet, outside, on every street. There is nothing attractive about it—in such a position, at least."

The difference between the master and journeymen plumbers at Jacksonville, Fla., has been adjusted and $3 will now be the pay and nine hours will constitute a working day.

The Master Plumbers' Association, formed last month at Lowell, Mass., through the efforts of National President Daniel G. Finnerty, composed of the following members, has affiliated with the National Association: H. H. Wilder, T. Costello & Co., S. H. Jones, H. R. Barker Mfg. Company, Farrell & Conaton, D. H. Wilson & Co., Drury & Green, James McLarney, J. W. Stewart, Scott & O'Day, Aaron C. Ladd, Jno. H. Barry, Ezra A. Nichols, Jas. Caddell, Wm. F. Enright. The following delegates were elected to attend the national convention: T. Costello, S. H. Jones, P. F. Conaton, D. H. Wilson.

Joseph Haire bid $1075 and secured the contract for the plumbing in the new Industrial School at Newport, R. I.

The Bridgeport Steam Heating Company, Bridgeport, Conn., are putting in a line of plumbers' supplies, which they will make a special feature of their business with the intention of furnishing everything required by the plumber to do first class work. They will, we understand, do no contracting and will not do any plumbing work, but will sell to the trade alone.

The Master Plumbers' Association of Worcester, Mass., met at the Builders' Exchange last week to discuss matters pertaining to the convention of the master plumbers, at Detroit, June 19. John F. Deedy and Henry Desper were elected delegates, with J. W. Jordan and O. S. Kendall as alternates.

Eugene Lewis has purchased the plumbing establishment of C. J. Tremaine, on Pine street, Bradford, Pa.

Delegates Elias Berla and Alexander Don of the Newark, N. J., Master Plumbers' Association will be accompanied to the Detroit convention by ten other members of their association who are interested in the work.

P. E. Cox of Fort Wayne, Ind., intends opening a branch plumbing shop in Columbia City, with Chas. Frixler in charge.

The Shuster Foundry, at Franklin and Willow streets, Philadelphia, report a good demand for their soil pipe and fittings, notwithstanding the dull times. This is mainly on account of the quality of their productions. Their pipe is guaranteed, and plumbers know that if a leak is discovered and traced to a sand hole or other defect in the pipe, the faulty length will be cheerfully replaced, and the time occupied in taking it out and putting the new length in paid for by the concern. Their fittings are appreciated by the trade because they are 2 inches longer on the bead end than the fittings commonly sold.

National Treasurer W. E. Goodman has made special arrangements for transporting the Milwaukee delegation to the Detroit convention of master plumbers. They will attend in full force.

The Brooklyn, N. Y., delegation to the master plumbers' convention at Detroit will leave on the 9.15 train on Sunday morning, over the Erie road, with a full representation.

The new Board of Plumbing Examiners has organized at Dorchester, Mass., by choosing Dr. G. H. Smith chairman and Plumbing Inspector Murray secretary. All plumbers who were not in the business previous to June 10, 1893, must take the examination, application for which had to be filed before June 15.

The Sanitary Plumbing Company, Columbus, Ohio, have opened a branch at Chillicothe, Ohio. E. Futerer and H. Hannon are two members of the company, who have also an expert sanitary engineer and a corps of skilled workmen. They will furnish a consulting engineer to the local plumbers and citizens who desire such service.

John Mitchell, president of the New York City Master Plumbers' Association, will lead the delegation to the Detroit convention accompanied by the Paterson, N. J., delegates in charge of John Hickman and the Bridgeport, Conn., delegation with a military commander, Major Middlebrook. The West Shore route has been selected, two special cars having been chartered, and the delegates are requested to be at the West Forty-second Street Ferry at 4.30 p.m. this afternoon.

Ex-President S. E. Dibble of the Connecticut State Association of Master Plumbers sends us a report of the fourth annual convention held at Hartford February 15. It is a book of 96 pages, giving portraits of the executive officers, a list of the officers and committees, the essays by Zalmon Goodsell, John Troland, Jos. G. Shearlock and Robert Morgan, a list of the members and the constitution and by-laws of the State association.

An interesting circular is being distributed by Thomas Kelly & Brothers, 123 Franklin street, Chicago, Ill., addressed to architects and the plumbing trade. The body of the circular is given up to testimonial letters, signed and dated, all of which speak in the most flattering terms of the Kelly specialties. Many of these letters are from very prominent users of sanitary goods, and they come from all parts of the country. The articles particularly noted on the circular are Kelly's self acting water closets, noiseless water closets, self acting urinals, stop and waste cocks and sanitary wash basins.

Peter J. Carpenter, Dobbs Ferry, N. Y., has secured the contract for the plumbing and gas fitting of J. J. McComb's new mansion. The contract was signed last week, and will amount to about $15,800.

A New Law in Massachusetts.

Last week Governor Greenhalge of Massachusetts signed the following law known as Chapter 455, "An act relative to the licensing of plumbers and the supervision of the business of plumbing:"

Section 1. No person, firm or corporation shall engage in or work at the business of plumbing, either as a master or employing plumber, or as a journeyman plumber, unless such person, firm or corporation has received a license or certificate therefor, in accordance with the provisions of this act. The words "practical plumber," as used in this act, shall be deemed to mean a person who has learned the business of plumbing by working for at least two years either as an apprentice or under a verbal agreement for instruction, and who has then worked for at least one year as a first-class journeyman plumber. The word "journeyman," as used in this act, shall be deemed to mean one who personally does any work in plumbing which is subject to inspection under Chapter 419 of the acts of the year 1892, or under any ordinance, by-law, rule or regulation made under the authority of this act.

Sec 2. Any person not engaged in or working at the business of plumbing prior to July 10 in the year 1893, and desiring to engage in or work at said business, either as a master or employing plumber, or as a journeyman plumber, shall apply to the Board of Health having jurisdiction in the locality where he intends to engage in or work at said business, except in cities or towns where the inspector of buildings has control of the enforcement of the regulations regarding plumbing, where such application shall be made to the inspector of buildings, and shall, at such time and place as may be designated by the Board of Examiners hereinafter provided for, to whom such applications shall be referred, be examined as to his qualifications for such business. On or before September 1 in the year 1894, every master or employing plumber, and every journeyman plumber, engaged in or working at the business of plumbing in this Commonwealth prior to July 10 in the year 1893, and desiring to engage in or work at said business in any city or town where licenses for plumbers are required, shall personally register his name and address at the office of the Board of Health or of the inspector of buildings, to whom applications for licenses are to be made in such city or town, and state after being sworn where and how long he has been engaged in or has worked at said business and whether as a master or employing plumber or as a journeyman plumber. Said Board of Health or inspector of buildings, if satisfied that the person so registering was actually engaged in or working at said business prior to said date, shall thereupon issue to him a certificate, setting forth that he was engaged in or working at the business of plumbing, either

as a master or employing plumber, or as a journeyman plumber, as the case may be, prior to July 10 in the year 1893, and authorizing him to engage in or work at said business, either as a master or employing plumber, or as a journeyman plumber. The fee for a certificate for a master or employing plumber shall be $2; for a journeyman plumber it shall be 50 cents. Said certificate shall be valid and have force throughout the Commonwealth. In the case of a firm or corporation the examination and licensing of, or the registration of and granting a certificate to, any one member of the firm or the manager of the corporation shall satisfy the requirements of this act.

SEC. 3. There shall be in every city, and in each town of 5000 inhabitants or more, and in each town having a system of water supply or sewerage, a Board of Examiners of Plumbers, consisting of the chairman or such other member of the Board of Health as said board may designate, and in cities or towns having an inspector of buildings, the inspector of buildings of said city or town, who shall be members *ex-officio* of said board and serve without compensation, and a third member who shall be a practical plumber of at least five years' continued practical experience, either as a master or as a journeyman, during the years next preceding the date of appointment. Said third member shall be appointed by the Board of Health of said city or town within three months from the passage of this act for the term of one year from May 1 in the year of appointment, and thereafter annually before June 1, and shall be allowed a sum not exceeding $5 for each day of actual service, to be paid from the treasury of said city or town. Provided, that if in any city or town there is no inspector of buildings said Board of Health shall also appoint the second member of said Board of Examiners, whose term of office and compensation shall be the same as is heretofore provided for said third member.

SEC. 4. Said Board of Examiners shall as soon as may be after the appointment of said third member meet and organize by the selection of a chairman, and shall then designate the times and places for the examination of all applicants desiring to engage in or work at the business of plumbing within their respective jurisdictions. Said board shall examine said applicants as to their practical knowledge of plumbing, house drainage and plumbing ventilation, and shall submit the applicant to some satisfactory form of practical test, and if satisfied of the competency of the applicant shall so certify to the Board of Health or inspector of buildings in their respective city or town. Said board or inspector shall thereupon issue a license to such applicant, authorizing him to engage in or work at the business of plumbing either as a master or employing plumber or as a journeyman plumber. The fee for a license for a master or employing plumber shall be $2; for a journeyman plumber it shall be 50 cents. Said license shall be valid and have force throughout the Commonwealth, and shall be renewed annually upon a payment of a fee of 50 cents. In case of removal beyond the jurisdiction of the board or inspector issuing the original license it may be renewed by any board having like authority.

SEC. 5. The Board of Health or Inspector of Buildings, where such inspector has control of the enforcement of the regulations regarding plumbing of each city and town mentioned in Section 3 of this act, shall within three months from the passage of this act appoint one or more Inspectors of Plumbing, who shall be practical plumbers of at least five years' continued practical experience, either as masters or as journeymen, during the years next preceding the date of appointment, and who shall hold office until removed by said board or inspector for cause, which must be shown. All such inspectors shall before appointment be subjected to an examination before the Civil Service Commission. The compensation of such inspectors shall be determined by the board or inspector appointing them, subject to the approval of the City Council or Selectmen, and shall be paid from the treasury of their respective cities or towns. Said inspectors shall inspect all plumbing work for which permits are hereafter granted within their respective jurisdiction in process of construction, alteration or repair, and shall report to said board or inspector all violations of any law, ordinance, by-law, rule or regulation relating to plumbing work, and also perform such other appropriate duties as may be required. The approval of any plumbing by any other inspectors than those provided for under this act shall not be deemed a compliance with the provisions thereof.

SEC. 6. No inspector of plumbing in any city or town shall inspect or approve any plumbing work done by himself, or any person by whom he is employed, or who is employed by or with him, but in each city or town subject to the provisions of this act the Board of Health shall appoint an additional inspector of plumbing, in the same manner and subject to the same qualifications as the regular inspector of plumbing, whose duty it shall be to inspect in the manner prescribed in this act plumbing work done by the regular inspector or any person by whom he is employed, or who is employed by or with him. Said additional inspector shall have authority to act in case of the absence or inability of the regular inspector, and shall receive for his services such compensation as the regular inspector would for a like duty. The provisions of this section shall not apply to any city or town which has heretofore established or may hereafter establish an annual salary for the position of inspector of plumbing, and in any such city or town no inspector of plumbing shall engage in or work at the business of plumbing.

SEC. 7. Each city or town of 5000 inhabitants or more, and every town having a system of water supply or sewerage, shall by ordinance or by-law, within six months from the passage of this act, prescribe rules and regulations for the materials, construction, alteration and inspection of all pipes, tanks, faucets, valves and other fixtures by and through which waste water or sewage is used and carried; and provide that no such pipes, tanks, faucets, valves or other fixtures shall be placed in any building in such city or town except in accordance with plans which shall be approved by the Board of Health of such city or town, or the inspector of buildings, where such inspector has control of the enforcement of the regulations regarding plumbing; and shall further provide that no plumbing work shall be done, except in the case of repair of leaks, without a permit being first issued therefor, upon such terms and conditions as such cities or towns shall prescribe. But nothing in this section shall prevent Boards of Health from making such rules and regulations in regard to plumbing and house drainage hitherto authorized by law, which are not inconsistent with any ordinance or by-law made under the authority of this section by the respective cities or towns within which such Boards of Health have jurisdiction. The provisions of this section shall not apply to the city of Boston or to any officer or board thereof.

SEC. 8. Any person violating any provision of this act, or any ordinance, by-law, rule or regulation made thereunder, shall be deemed guilty of a misdemeanor, and be subject to a fine not exceeding $50 for each and every violation thereof, and if such person has received a license under this act, his license may be revoked by the board or inspector issuing the same, and if such violation was committed in a city or town other than that where he received his license, the Board of Health or inspector of buildings having jurisdiction may forbid him to engage in or work at the business of plumbing for a period not exceeding one year in the city or town where the violation was committed.

If any person to whom a certificate has been issued under this act violates any provision thereof, or any ordinance, by-law, rule or regulation made thereunder, either the Board of Health or Inspector of Buildings issuing his certificate, or the Board of Health or Inspector of Buildings having jurisdiction where such violation was committed, may forbid him to engage in or work at the business of plumbing in such city or town for a period not exceeding one year. Any person engaged in or working at the business of plumbing in any city or town where he has been forbidden to do so under this section shall be deemed guilty of a misdemeanor, and be subject to a fine not exceeding $100 for every such offense. Any city or town mentioned in Section 3 of this act refusing to comply with any of the provisions of this act shall forfeit the sum of $50 to the use of the Commonwealth for every month during which such neglect may continue.

SEC. 9. The provisions of this act shall apply to all persons who are now or may be hereafter learning the business of plumbing, when they are sent out to do the work of a journeyman plumber.

SEC. 10. Any person now holding an appointment as inspector of plumbing may retain his position, and without further examinations, be deemed to have been appointed under this act.

SEC. 11. The Boards of Health and inspectors of buildings hereinbefore mentioned may expend such portion of all fees collected by them under this act as shall become necessary to properly perform all duties imposed by the passage of this act. The said boards or inspectors shall annually, before June 1 make a full report in detail to their respective cities or towns, of all their proceedings during the year under this act.

SEC. 12. All acts or parts of acts inconsistent herewith are hereby repealed. The provisions of this act, so far as they are the same as those of chapter 477 of the year 1893, shall be construed as a continuation of that chapter, and not as new enactments.

A NEW PLUMBING ESTABLISHMENT has been opened at 104 Main street, Ottawa, Ill., by Read & Law of Chicago.

BISSELL CHAMBERLAIN has opened a plumbing shop in the Walden Block, Willimantic, Conn.

C. H. WILLIAMS will represent the New York Central Iron Works, Geneva, N. Y., at the plumbers' convention at Detroit, and the Dunning steam and hot water heater will be incidentally the subject of an occasional remark.

Simple Remedy for Trouble in a Telephone.

The following letter to the *Electrical World* is pertinent at the present time when telephonic communication between the several departments of manufacturing establishments is becoming so common:

"A friend of mine in a neighboring establishment has a telephone containing three ordinary Bell receivers, which are used both as transmitters and receivers. They gave trouble constantly. One would be reported as 'not talking,' and he would take off the cap and find nothing wrong, would put the cap back again and it would work all right. Perhaps in an hour or so it would again refuse to act. This was kept up for several months. He tried varying the distance of the diaphragm from the magneto, and also examined the circuit time and again, but with no better success. One day we noticed that the edge of the orifice of the cap came very close to the diaphragm, and I suggested that perhaps a drop of saliva might lodge against the diaphragm and the edge of the orifice and impede vibration. This was found to be the case, and a ring of thick cardboard placed between the cap and the diaphragm remedied the trouble completely."

A New Bedford, Mass., rope company have received an order from a Chicago firm for a rope which, it is said, will be the largest ever made. It is to be used on the driving wheel in the engine room of the Chicago Cable Road Company. It will be 3 inches in diameter and 11 inches in circumference. There will be 12 of these ropes on the wheel; each of them will be 1260 feet long and the combined length of the 12 ropes will be 3 miles. The cost will be $5000.

Petroleum in paying quantities is being found in Wilson, Neosho and Allen counties, Kansas, and about 40,000 acres of land have been leased by oil operators from Pennsylvania.

Baltimore comes next in importance to New York as a grain shipping port, handling 50,000,000 to 60,000,000 bushels annually, and about 3,500,000 barrels of flour.

TIN PLATES.

A Strange Statement.

It will be news, indeed, to the trade that the tin plate mills of this country have during the past winter been selling nearly all their product in Canada, "the boasted home market having proved insufficient to furnish a source of trade." Yet this is the surprising statement made editorially in a recent issue of a Pittsburgh daily. The announcement was so authoritatively made that it probably set some uninformed persons wondering whether the American tin plate manufacturers had already opened up a large export trade for their product. The facts of the case, however, given on the best authority, prove that the writer of the statement in question has gotten hold of a very small mole hill, and with the aid of an exceedingly powerful imagination has magnified it into a mountain of great proportions. In a late issue of *The Metal Worker* an extract was given from an article in the *Canadian Manufacturer*, which spoke in high terms of the superior qualities of a box of assorted tin plates of American manufacture which had been received and tested by a Toronto manufacturing firm. This one shipment of a single box of American plates, sent for comparison with the Welsh product, covers, so far as we have been able to ascertain, the entire export movement, which, according to the Pittsburgh *Post's* statement, has of late absorbed nearly all the product of our domestic tin and sheet mills. Of course, every one with a grain of information is aware that American tin plate makers cannot yet hope to sell their goods in Canada in competition with the Welsh product. Nor do they need to seek outside markets, for there is, as we have before pointed out, an active demand within the limits of the United States for every sheet of tin and terne plates they can at present produce.

SCRAP.

ÆTNA STANDARD IRON & STEEL COMPANY, Bridgeport, Ohio, have two mills in operation, rolling black plates for tinning. The firm's new tinning department will be completed within a few weeks, when they will commence the manufacture of both bright and terne plates.

A CONSIDERABLE QUANTITY of black plate is now being shipped from Great Britain to Italy, to be converted into turned plates in the lately established works at Plombino.

THE BRITTON ROLLING MILL COMPANY, Cleveland, Ohio, manufacturers of iron and steel sheets, and who have had under erection for some time a plant for the manufacture of tin and terne plate, advise us that one tin mill will be started on Monday, the 18th inst., providing a supply of coal can be obtained. This firm expect to have two more mills in operation by August 1 next.

ACCORDING to the British Board of Trade statistics for May, 1894, the total exports of tin and terne plates from Great Britain during the month were 30 000 tons, against 37,000 tons in May, 1893. Shipments to the United States show a considerable increase over those of April, and were larger than in any previous month of this year. The following figures show, in round numbers, the shipments to this country since January 1: January, 18,000; February, 13,000; March, 16,000; April, 13,000; May, 21,000 tons. In May, 1893, the receipts of Welsh tin plates amounted to 26,000 tons.

THE MORFA TIN PLATE WORKS, Llanelly, South Wales, were restarted this week after a prolonged suspension.

CAPITALISTS of Cambridge, Ohio, have announced their intention of building a rolling mill for the manufacture of black plates for tinning purposes. The proposed plant is to be built at the junction of the Baltimore & Ohio and the Cleveland & Marietta railroads, and will consist of about six mills, together with a train of cold rolls and complete equipment. The buildings projected are one 200 x 100 feet for rolling mill purposes, one 200 x 60 feet for annealing, pickling and shipping, and a boiler house 40 x 60 feet. All buildings will be constructed of steel and iron and the machinery has been designed to conform to modern ideas of economical production of the best quality of plates obtainable. The leading spirits of the enterprise are John Marquand, C. L. Campbell and John C. Beckett, all of Cambridge. It is expected that the organization will be completed in a few days.

THE TIN HOUSE recently erected by the Ætna Standard Iron & Steel Company, Bridgeport, Ohio, has a capacity for tinning about 900 boxes of black plates per week, the outfit consisting of three sets, one for terne and two for bright plates. This firm do not expect, however, to put any coated plates on the market until about July 1. Their black plate mills have been in operation for about ten days working up stock for the tinning house. Their rolling mill proper is working to about two-thirds capacity on natural gas, the remaining portion being off on account of the coal strike.

NEW PHILADELPHIA IRON & STEEL COMPANY, New Philadelphia, Ohio, are adding six tin mills to their plant and will, we are informed, shortly be in the market with black sheets for tinning purposes, in addition to their former line of sheet iron products.

EASTERN TIN PLATE MANUFACTURERS are at the present time feeling the effects of the coal strike in the dearth of American black sheets. They find it very difficult to obtain a sufficiency of the domestic product and are obliged to exercise the virtue of patience to an uncomfortable degree. As an illustration of the active demand now existing for American sheets for tinning purposes, the New York agent of a Western sheet mill mentioned a day or two ago the fact that he had just been obliged to refuse large orders from three tin plate makers who came at almost the same time, one wishing for ten carloads of black sheets, prompt delivery, for spot cash another two carloads a week for eight weeks, and the third wanting to take as much of the material as he could get. All the black sheet mills are rushed with orders and tin plate manufacturers are said to show a marked disinclination to take any but the American rolled product, which they find much better suited to their purposes than the imported article.

ACCORDING to a return published last week by the secretary of the Welsh Tin Plate Makers' Association, there are at the present time 90 tin plate works, with 510 mills, in existence in Great Britain. Of these mills, 330 are in operation and 180 are idle. Among the latter, however, are about 30 which are virtually out of business altogether and not likely to restart. Consequently the proportion of idle producing capacity is about 30 per cent. of the whole, a smaller ratio than was generally believed to be inactive. Since the above figures were given one or two of the then idle mills are reported to have resumed operations, still further reducing the proportion of idle works

Trial of the U. S. Cruiser "Minneapolis."

On her preliminary trial trip last week, the new Philadelphia built triple screw cruiser "Minneapolis" attained the remarkable speed of 22.26 knots per hour, under the disadvantage of burning anthracite coal instead of the Pocahontas coal, always used on trial trips hitherto. Her sister vessel, the "Columbia," only made 20.98 knots on her first trial, so that the "Minneapolis" showed fully 1¼ knots greater speed. The trip was made off the New Jersey coast under far from favorable conditions as regards weather. Nevertheless the trial proved throughout the most satisfactory and successful run of any ships the Cramps have built. Passed Assistant Engineer Willets, who represented the Engineering Bureau on the "Minneapolis'" trial trip, reports that the performance of the machinery was remarkably good. On the 7th a maximum speed of 22 26 knots was maintained in deep water for an hour with an average of 128 7 revolutions per minute of all three engines, steam pressure 160 pounds at the boilers, forced draft of less than 1 inch air pressure, throttle half open. The displacement of the ship was less than 7000 tons, and the speed was recorded by patent log, corrected from runs over a known course the day previous. The engines ran very quietly and steadily at all speeds with no unusual vibration. The indicator cards taken on the last part of the deep sea run were worked out, showing 20,080 horse-power. The "Minneapolis" will make her official run about July 9.

Illuminating oil sold by the Standard Oil Company has touched this week the lowest price ever reached, the result of a fight against outside dealers.

STEAM AND HOT WATER.

Master Fitters' Convention.

The preparations for the sixth annual convention of the Master Steam and Hot Water Fitters' Association of the United States, which begins Tuesday of next week at the Broadway Central Hotel, New York, are being rapidly completed, and Secretary Reynolds reports that according to all the promises that are made, it is destined to be a surprisingly large and successful gathering. No one needs to be informed that the year just closed has been a difficult one for the trades, and anything that is adverse to business prosperity is likewise adverse to the prosperity of trade associations. In the West in some ways the depression has been particularly hard upon the steam and hot water fitters, but diminished business has been an unpleasant characteristic throughout the whole country. With these adverse conditions, therefore, it is particularly gratifying to hear that the reports from the members go to show that interest is unabated in the national organization and that the attendance promises to be large.

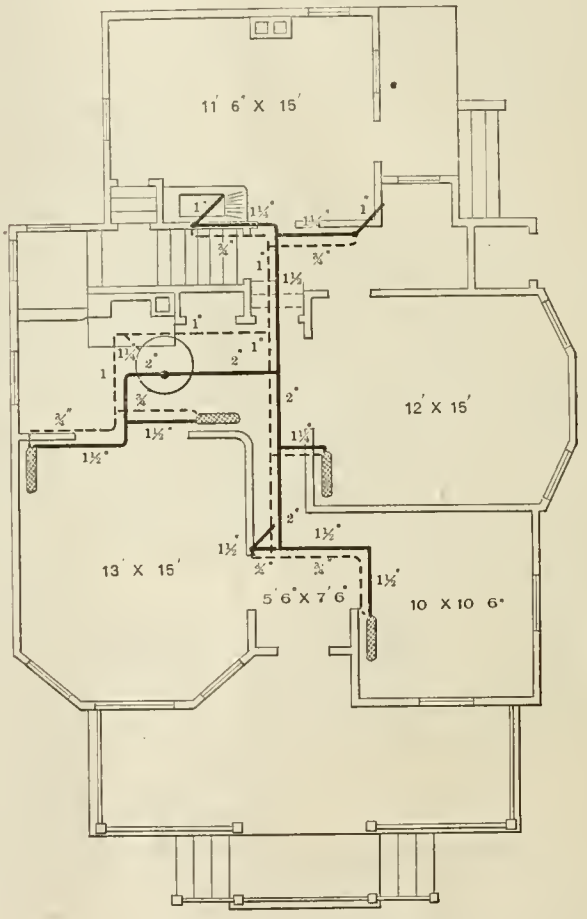
The Broadway Central Hotel is conveniently located, being half way between the downtown trade center and the uptown attractions of the city. One of the best indications of the success of the coming convention is the interest that is being taken by the manufacturers of boilers, supply houses and kindred concerns. It goes without saying that if they did not look for a representative gathering they would go to little trouble to be present or have their goods shown. As a matter of fact already a very large number of applications have been made for space and many prominent concerns will have representatives at the hotel. The following is a partial list of manufacturers who have already made arrangements to be present or represented at the convention:

Jenkins Bros.
American Radiator Company.
U S. Steam Heater Company.
N. P. Andrus.
A. A. Griffing Iron Company.
Fowler Radiator Company.
Raymond & Campbell Mfg. Company.
Richmond Stove Company.
American Boiler Company.
Boynton Furnace Company.
Thayer Heater Company.
Kennedy Valve Company.
Walworth Mfg. Company.
Fosket & Bishop Company.
Herendeen Mfg. Company.
Gurney Heater Company.
Smith & Anthony Company.
Niagara Radiator Company.
E. F. Keating.
Henry R. Worthington.
Thatcher Furnace Company.
Abendroth Bros.
Crane Company.
H. B. Smith Company.
Fuller & Warren Company.
J. H. McLain Company.
Deane Steam Pump Company.
Page Boiler Company.
Ideal Boiler Company.
Eaton, Cole & Burnham.
Model Heating Company.
Timothy Kieley.
Nason Mfg. Company.
W. C. Mowry.
Wells & Newton.
New York Central Iron Works.

F. T. Davis, Portland, Maine, for the past two years agent for Smith & Anthony Stove Company's Hub heaters in Portland and vicinity, has associated himself with Reuben Westcott and together they will continue to represent the Hub heater.

Small Return Pipes.

We have had opportunity lately to inspect a steam heating plant installed by George H. Murphy, Bound Brook, N. J., in the residence of George B. Stryker of the same place. Mr. Stryker is an architect and contractor, and the plans herewith show the first and second floors of his residence, which was completed during the past winter. Fig. 1 shows the first floor and the location of the radiators and the boiler and the pipes in the cellar beneath. Fig. 2 shows the upper floor and the location of the radiators. The building is exposed on all sides, but has been heated to the entire satisfaction of the occupants. One of the Auburn steam boilers made by F. W. Wright, No. 6 Bridge stores, New York, was used, and the piping, which was run in accordance with the ideas of Mr. Murphy, is a combination of the one and two pipe systems. No return pipe is placed above the cellar ceiling, and all of the radiators are attached by means of a single connection. The return pipe is connected in each case by a tee at the bottom of the riser to the radiator above.



Small Return Pipes.—Fig. 1.—First Floor, Showing Boiler and Piping.

A 2½-inch main is taken from the top of the boiler and a 2 inch branch runs each way from it. The left hand branch merges into two 1½ inch branches, one of which is connected with the hall radiator, which has 44 feet of radiating surface; the other branch continues to the parlor radiator, which has 44 feet of surface also. The other main of 33 feet each, one in each of the front bedrooms. The main in the cellar is continued 1½ inches in size to a 33-foot radiator in the office on the first floor. Directly under the riser which runs to the radiator in every case a ¾-inch return pipe is connected by means of a tee, as shown in Fig. 3. The size of the return pipe where it connects

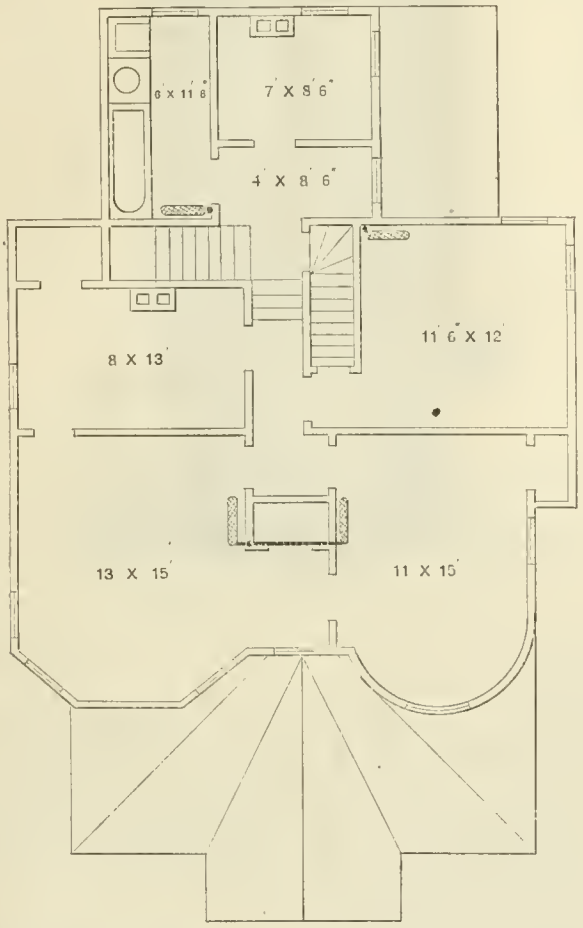


Fig. 2.—Second Floor and Radiators.

branches into a 2-inch and a 1½ inch main, the smaller one running toward the back of the house, branching into two 1¼-inch mains and continuing until a 1-inch riser is taken from each—one to the bathroom radiator, with 22 feet of surface, and the other to the chamber

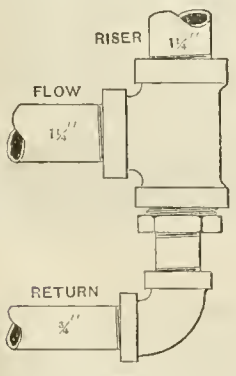


Fig. 3.—Showing Method of Connecting Return.

above the dining room, which has 33 feet of surface. The 2-inch branch main runs toward the front of the house, a 1½-inch branch being taken off to the radiator of 44 feet of surface in the dining room, and continuing on a 1½ inch riser is taken to the second floor and a 1-inch connection made to two radiators in every case is ¾ inch, and the returns from the parlor and hall radiators continue this size all the way to the heater.

The returns from the bathroom and dining room chamber are ¾ inch up to where they join. At that point they connect with a 1-inch pipe, which runs to a point where it joins with the return from the front of the house. The returns from the front chambers and the office are ¾-inch and connect with a 1-inch pipe where they meet. This 1-inch pipe receives a ¾ inch return from the dining room and runs on and connects with the return from the back of the house, where a 1-inch pipe runs over to the boiler. At the boiler all of the returns connect with a 1½ inch pipe, which drops down and connects with the heater at the bottom. The flow mains of this job have the usual amount of pitch, but the returns have three or four times as much and no difficulty is experienced in running the system satisfactorily on less than a pound of pressure at the boiler. The use of such small returns is unusual, but is attended with success, to which the sharp decline which they have toward the boiler contributes not a little. Mr. Murphy is a qualified master plumber and has spent several years in large car shops, where in addition to doing plumbing work he worked iron pipe in all shapes, bending it either cold or hot, and through his ability rose to a superintendency of the car heating department. The plant illustrated is but one of many that he can show in successful operation.

Some Generous Comments.

From A. C. Edgar, *Philadelphia.*—In an article appearing in the May number of one of your contemporaries, "Chicago" criticizes the methods of piping a hot water job as shown in *The Metal Worker* of February 10, 17, 24. "Chicago" wishes the reader to understand that all contributors to *The Metal Worker* are not practical, but get their ideas from that great deceiver, theory. The piping proposed by "Helios" in *The Metal Worker* of February 17 is pronounced by "Chicago" "so impracticable that they are not worth mentioning." This statement seems to satisfy "Chicago," but it so seldom occurs that all are of the same opinion that this statement is not satisfactory without some proof of its correctness. "Helios" is a practical engineer with an enviable reputation and generally taken as authority on subjects of this kind, always giving explanations that are satisfactory to practical engineers who recognize that there is frequently more than one way of obtaining the desired results.

"Chicago" claims that "the second opening from the main will not circulate until the first has a good circulation." This is not so, as my practical experience (of less than 30 years) has taught me that it is possible, by taking the openings near boiler from side of main, and others at different angles, as the conditions require, to obtain an equal circulation in all radiators.

"Chicago" criticises several other correspondents in the same strain whose plans have as little need of defense.

The system recommended by "Chicago," which he calls positive, cannot be called good practice, for when in operation the radiators on third floor will be at higher temperature than those on the lower floors, and the radiators on first floor being generally much larger than the upper ones, will give poor results when fed from returns. The valves near ceiling on main return is another objection to this positive system, and carrying the return from lower radiators to ceiling will not allow the free circulation that there would be if returns were carried along the floor. I consider that "Chicago" has neglected the most important part of the job in not giving sizes of pipes and radiators, which, if not properly proportioned, will prove a failure. I know there are few systems that cannot be changed. Often changes are made that increase the efficiency of the apparatus, but many are made simply to satisfy personal fancies. Of all the systems recommended, I think "Chicago's" no better than some, and not nearly as perfect as others. I am not objecting to "Chicago" upholding the system he proposes, but I think he should be more charitable to the lesser lights who venture to express their opinion, by not condemning all systems that do not meet with his approval.

The Model Heating Company, Philadelphia, Pa., announce, under date of June 1, that they have secured the services of M. B. Moore, formerly with the Boynton Furnace Company, who will give his attention to the interests of the Novelty circulator and the Novelty steam generator for hot water and steam heating.

Crane Company's New Valves.

The Crane Company of Chicago and New York have recently brought out some new valves, two of which are herewith illustrated. Fig. 1 is a wedge gate straight way valve, designed for ordinary pressure, for either steam or water, and made in all sizes from 2 to 24 inches. The gate is guided in the body by ribs, which insure true and

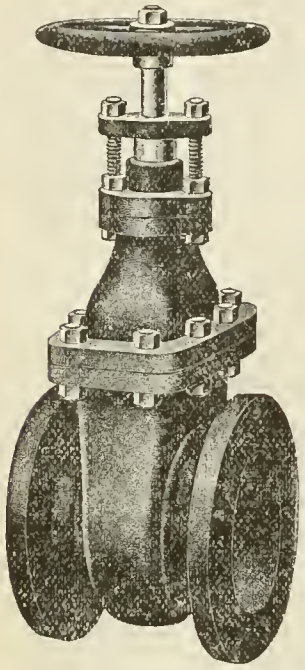


Fig. 1.—The Crane Wedge Gate Straight Way Valve.

easy movement and prevent wear of the faces as well as prevent the disks from touching the seats of the body of the valves except at the point of closing. The seats in the body of the valves and the faces of the disk are made of bronze metal. These valves are furnished with

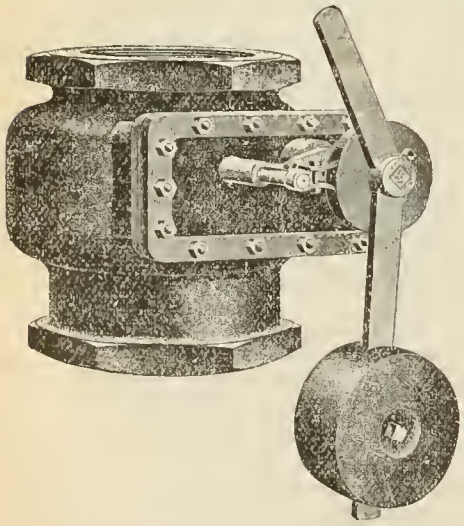


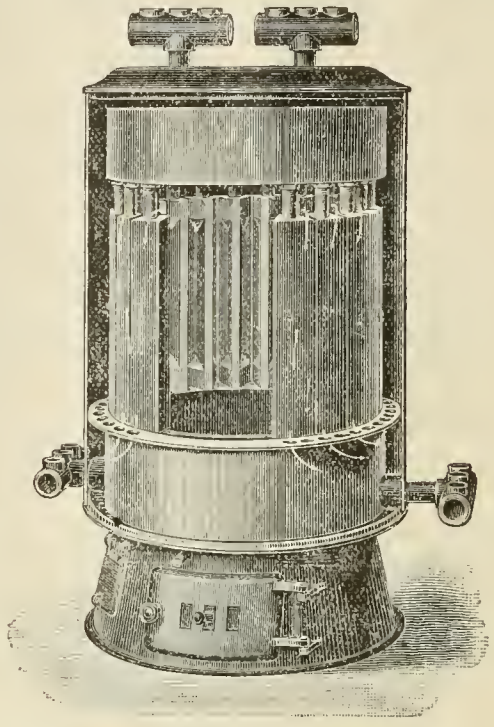
Fig. 2.—The Crane Noiseless Back Pressure Valve.

either screwed, flanged or hub ends, with stationary stem, with outside screw and yoke, with bevel and spur gearing, with gearing and by-pass relief and with indicator. The manufacturers claim many points of advantage for this style of construction and have applied for patent.

Fig. 2 illustrates Crane's patent noiseless back pressure valve for condensing and non-condensing engines. It is constructed with a piston having ports around its sides, the combined areas of which are greatly in excess of that of the pipe. This piston is accurately fitted to the body of the valve, in which it slides freely. When pressure is brought against the under side of the piston it rises, opening the ports just sufficient to let the steam escape, and at the same time it maintains the pressure for which it is set. It has no seat. The opening and closing of the valve are regulated entirely by the weight. This valve was designed to overcome the objectionable and destructive hammering peculiar to the common back pressure valve. Complicated adjustments were avoided, so that it is not liable to get out of order.

Standard Hot Water Heater.

A new form of hot water heater known as the Standard is being placed on the market by Giblin & Co., Utica, N. Y. Fig. 1 is a view of the heater with the casing removed, showing the inner construction, while Fig. 2 is an illustration of the water sections forming the portion of the boiler between the fire pot and upper drum. The heater is made entirely of cast iron, with the exception of the nipples. The construction, as indicated, is vertical, so that the water has a free and clear passage, and it is pointed out that the water goes into circulation as soon as it passes over the hottest surfaces. Another point alluded to is the way the water is spread over a large surface in sheet form so as to effectively absorb the heat of the fire. The boiler proper consists of a water space fire pot into which are screwed a number of vertical sections, forming a large combustion chamber. A water space reservoir forms a large crown sheet surface over the fire, and is connected to the ends of the vertical sections by nipples of sufficient length to permit the products of combustion to pass out and downward in contact with the entire outer surfaces of the sections and of the fire pot. Fig. 2 is an illustration of the water sections used in the Standard boilers. These sections, occupying a vertical position in the boilers, are designed to give easy circulation



The Standard Hot Water Heater.—Fig. 1.—View of Boiler with Casing Removed.

and to readily absorb the heat. Each of the sections presents a large surface to the direct rays of the fire and at the same time holds comparatively little water. The surfaces of the sections are T-shaped, so that when a number of them are arranged in a circle with narrow ends to the fire, a very large fire surface is the result. It is pointed out that the

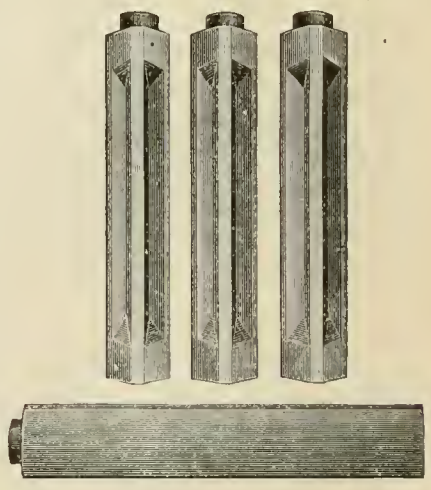


Fig. 2.—View of Sections.

surfaces being vertical do not collect dirt. They are connected with the fire pot by short nipples and are screwed down tight to it, the fire pot and sections each taking one-half of the nipple. The tops of the sections are formed like hexagon shaped nuts, so that one or more of them may be readily removed and others inserted in case of accident. A special feature to which the manufacturers direct attention is the down draft. They claim to have improved the ordinary application of this principle by adding a perforated ring plate which rests on and is on

a line within the top and outer surface of the fire pot, Fig. 1, and serves to distribute the draft uniformly over the outer boiler surface. This distribution is accomplished by having the smallest holes in the plate directly over the indirect smoke collar, which serves to prevent a direct down draft at that point, and the holes are graduated in size so that in the front of the boiler the largest holes in the plate are found. The entire upper section of the combustion chamber, it is pointed out, is thus kept hot and the drafts traveling through the perforated plate pass below the plate and outside the hollow fire pot, thus inclosing it between the fire itself and the heated products of combustion. The Standard hot water heater is made in three sizes: Diameter of fire pot 15, 20 and 24 inches; adapted to supply from 350 to 1200 square feet of direct radiation. These boilers are used for both steam and hot water, the only change being in the size of the reservoir and the trimmings.

HEATING NOTES.

The Raymond & Campbell Mfg. Company, Middletown, Pa., have received the contract from one of the largest jobbing houses in Paris, France, for supplying their Lindemuth Sun (steel) steam and hot water boilers. The French company have branch houses in most of the leading cities throughout France, and in their agreement they ask for the entire control of this boiler for France, which offer, we understand, the company have about decided to accept.

Home Comfort radiators, manufactured by Reuben Westcott, successor to the Portland Heater & Radiator Company, Portland, Maine, are now made for either hot water or steam. A change in form also has been made, substituting a flat top for the old style. A feature of this radiator is a projecting base and a nickel rail foot rest designed to take the place of an open grate for warming the feet.

We are indebted to the American Radiator Company, Chicago, Ill., of which J. A. Goodrich, 92 Centre street, is New York manager, for a copy of their new pocket catalogue, illustrating the various styles of radiators manufactured by them. It conforms to the excellent taste and style that distinguish the work of this concern, the catalogue being an end opening publication 7½ inches long and 4½ inches wide, bound in black with silver lettering. The title pages gives the name of the concern and the addresses of their Chicago, New York, Boston, Minneapolis and Denver offices, a list of their officers and directors and the location of their factories at Detroit and Buffalo. In directing the attention of the trade to the contents of this little pamphlet they point with pardonable pride to an assortment of radiators which they say has resulted from an experience covering a period of more than a quarter of a century. They emphasize the fact that the loops of the American radiators contain the full area of heating surface claimed and are arranged to give the most effective results. The volume is divided into three parts, the radiators illustrated on pages 6 to 38 being manufactured at their Pierce plant, at Buffalo; those on pages 40 to 54 being manufactured at their Detroit plant, Detroit, Mich.; while those on pages 57 to 87 are made at their Michigan plant, Detroit, Mich. The extent of the line of radiators made by this company is well understood by the trade and needs no particularizing here. At the end of the pamphlet are directions for decorating, telegraphic code, &c. The printing is done in black and red and high grade paper makes a fine display of the engravings and of the type.

At a recent meeting of the Sperl Heating Company, Carbondale, Pa., drafts of proposed buildings were submitted by their engineer. They are to be of the slow burning mill construction style, and bids will be asked from builders as soon as specifications are completed. The company now have space in another manufactory, where their workmen are making three sizes of boilers and patterns for another size are nearing completion.

A mammoth poster is sent us by the Herendeen Mfg. Company, Geneva, N. Y. The feature of the sheet is a sectional view of the Faultless Furman hot water boiler, lithographed in colors. The construction of the boiler is clearly shown and the course of the water currents and products of combustion indicated.

The Raymond & Campbell Mfg Company, Middletown, Pa., manufacturers of the Lindemuth Sun (steel) steam and hot water boilers, will have one of their boilers on exhibition at the coming convention of the Master Steam and Hot Water Fitters' Association, which is to be held on the 18th, 19th and 20th of this month at the Broadway Central Hotel, New York City. H. H Lindemuth, their mechanical engineer, will be in charge of the exhibit and will be glad to meet all the friends and customers of the company, and will no doubt take pleasure in explaining the many interesting features of his boiler, even to those who are not at present patrons of the company.

The Richmond heaters are the subject of description and illustrations in two pamphlets that have been received. The catalogues, of convenient size, are bound in scarlet paper and give full illustrations and descriptions of the extensive line of Richmond heaters. One of these pamphlets is issued in the interest of Webster & Meathe, Detroit, and the other carries the name of George T. Barnes, Newburg, N. Y.

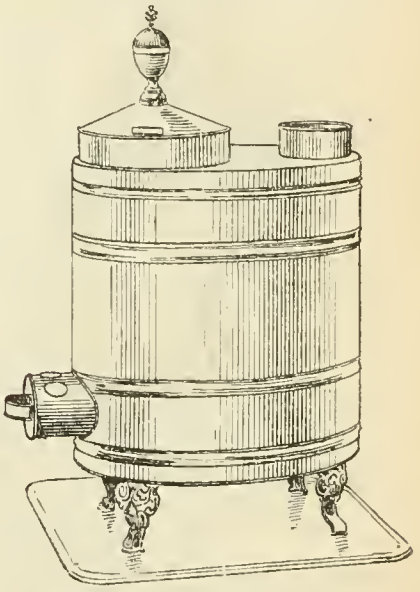
The Smith & Anthony Company of Boston will be well prepared to meet their friends at the steam fitters' convention in New York next week They have secured one of the best spaces at the Broadway Central, just at the left of the staircase in the basement. There they will show samples of the Hub steam heater and Hub hot water heater, and their representatives in attendance will welcome the trade. They have also secured parlor No. 357, where they invite all their friends to call and make themselves at home.

B. H. Rose has accepted a prominent position with the American Boiler Company and will be located in their Chicago office. Mr. Rose is well known in the trade, having been connected with the Hardware business for the past 20 years. He has resigned his office as treasurer of the Pullman Sash Balance Company of Rochester, N. Y.

The condition of depression into which the business of the United States fell in the latter half of last year is clearly illustrated in the report of the Chamber of Commerce of this city, just issued. The Clearing House exchanges for 1893 are therein stated to have been no less than $5,649,367,056 under those of the previous year, and the lowest in amount since 1888. The value of the imports of foreign merchandise in 1893, exclusive of coin and bullion, was nearly $100,000,000 less than the total for 1892, while exports in the same period showed a comparative decrease of $63,000,000.

Cole's Air Tight Heater.

The accompanying cut represents a general view of what is known as Cole's Air Tight Heater, now being manufactured by Cole & Cole, 41 Main street, Council Bluffs, Iowa. This stove is constructed with a view to using wood, cobs and, in fact, all kinds of light fuel. It is made of sheet metal lined with sheet steel, and has a separate collar in the lining of the stove which thoroughly protects the draft opening.



Cole's Air Tight Heater.

The makers are offering this stove in three sizes and two styles, using smooth iron in the cheaper and Russia iron in the higher styles. The length of wood which can be burned is indicated by the numbers of the stoves. It is claimed that the Air Tight Heater will hold fire 20 hours using cobs as a fuel, and 48 hours burning wood. When shut up the stove is safe from sparks or fire, as it has no doors to jar open or apertures through which fire or sparks can escape. The company state that the large size stove will hold 2 bushels of cobs, the combustion of which can be so controlled as to give a steady, slow heat for the period named above.

The popularity of municipal bonds with investors at the present is evidenced by the *Financial Chronicle's* published table of such issues marketed during May. The total amount of sales reported in that month was $14,350,000, a considerable increase on any monthly sales this year, and exceeded only once since the establishment of the record. The high prices paid, too, were remarkable. Several cities have placed their bonds on more favorable terms than they have ever been able to secure before.

The revenue of Canada for the month of May shows a falling off of over $500,000, as compared with the corresponding month last year. The decrease for the ten months of the fiscal year is over $13,000,000.

ROOFING AND CORNICE.

The Country Cornice Shop.

X.

BY CORNICE WORKER.

Patterns for Y-Branches, Round Pipes.

In Fig. 98 is shown the method of connecting two molded eave troughs with one leader by means of a Y-branch. in case the leader is frozen tight at the bottom.

The method of obtaining the patterns for the Y is shown in Fig. 99. The first step is to draw correctly the plan and elevation of the Y-branch, having them in their relative position to each other as shown in Fig. 99.

Let C¹ D E F G, Fig. 99, represent a front elevation of a Y-branch, corresponding to any given angle, shown by B C D E F, Fig. 98, and let B, Fig. 99, be the plan view of the larger pipe and A and C the plan views of the two smaller pipes. It will be noticed that the angles of the Y, as shown by C¹ D E and E F G, are both alike, and therefore only one set of patterns is required. It will be noticed that the smaller pipe C, Fig. 99, abuts against the larger pipe B in plan, the centers being in one line. Now, if the center points of the pipes were placed to one side of each other, the principles used in obtaining the patterns would still be the same. To obtain the pattern for the Y-branch, as shown by the plan and elevation in Fig. 99, proceed as follows: Divide the smaller pipe C in plan into any number of parts, as shown by the small figures, and have the seam to be placed as shown at A¹. Now at right angles to the line

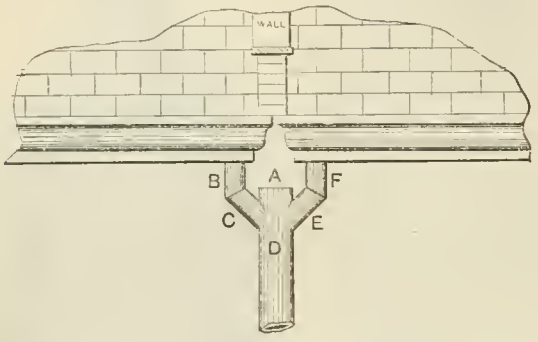


Fig. 98.—Method of Connecting Two Molded Eave Troughs by Means of a Y-Branch.

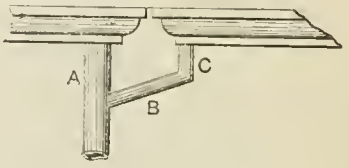


Fig. 100.—Method of Connecting Two Eave Troughs with a Leader by Means of a T-Joint.

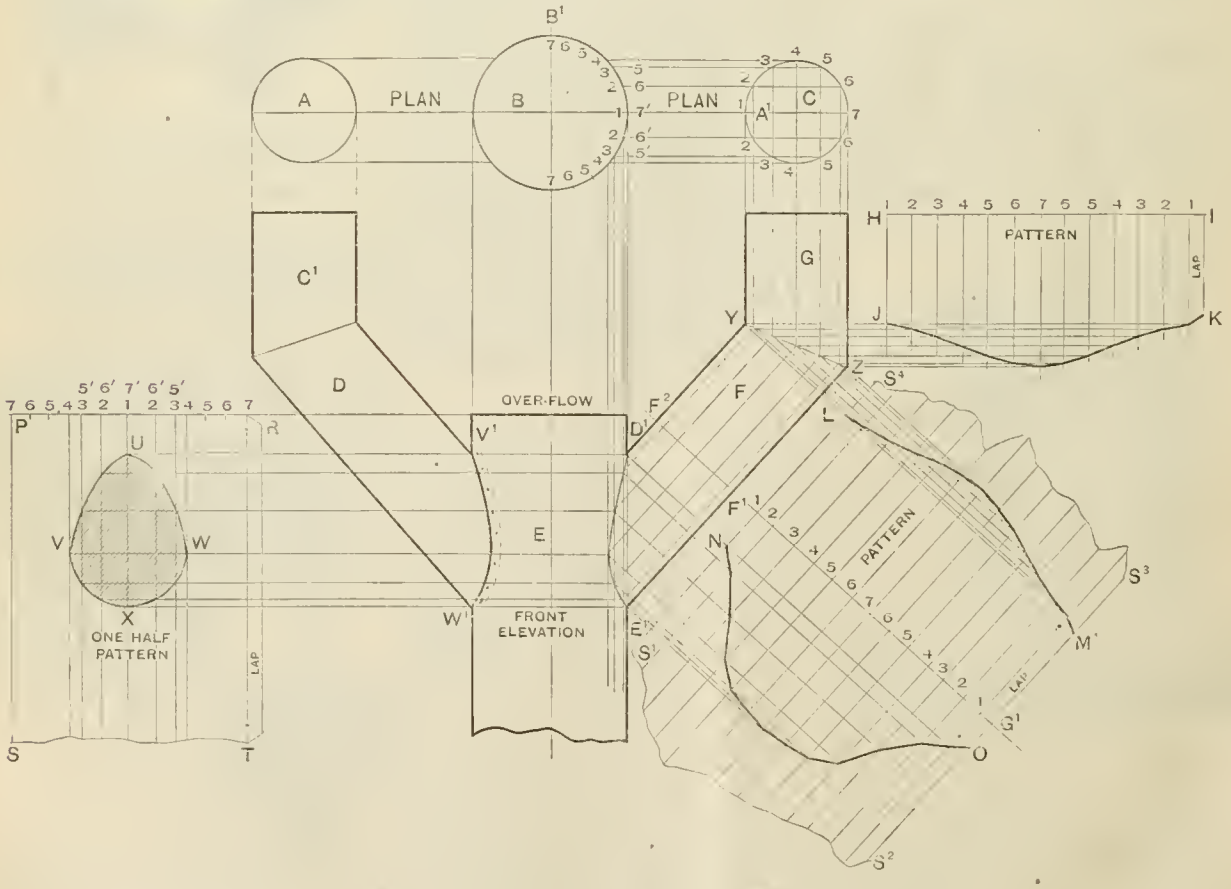


Fig. 99.—Development of Pattern for a Y-Branch Made of Round Pipe.

THE COUNTRY CORNICE SHOP.—PATTERNS FOR Y-BRANCHES MADE OF ROUND PIPE.

It will be noticed by referring to the front elevation, Fig. 98, that the leader D runs slightly above the miter joints of the Y, as at A, which can be left open, and serve as an overflow in case of the sewer or leader stopping up, or

E B¹, Fig, 99, draw lines from the small figures on the circle C, intersecting the larger circle or center leader B, as shown by the intersections 4, 3 5′, 2 6′ and 1 7′, &c., corresponding in number to 4, 3 5, 2 6 and 1 7, &c., of the smaller circle C. Parallel to the line B¹ E drop lines indefinitely from the intersections on the plan B, as shown. Now from the spaces obtained on the plan C, Fig. 99, drop lines parallel to B¹ E intersecting the miter line of the elevation Y Z. From the intersections obtained upon the miter line Y Z draw lines parallel to the lines of the pipe Y D¹ or Z E¹ intersecting the perpendicular lines of corresponding numbers dropped from the intersections on the plan B. A line traced through these intersections, as shown from D¹ to E¹, will be the required miter line from which to obtain the measuring points for the pattern. For the pattern for that part of elbow shown at G proceed as follows: At right angles to B¹ E draw the stretchout line H I, upon which place the stretchout of the smaller pipe C, as shown by the small figures on the line H I. Now at right angles to H I, or parallel to B¹ E, drop lines indefinitely from the small figures, as shown, which intersect with lines of corresponding numbers drawn parallel to H I from the miter line Y Z. A line traced through these intersections, as shown from J to K, will be the required miter cut; or H J I K will be the required pattern for that part of elbow shown at G, Fig. 99. A lap is allowed for riveting, as shown. To obtain the pattern for that part of the elbow shown at F, and intersecting the larger pipe E, proceed as follows: At right angle to the line of the pipe E¹ Z draw the stretchout line, as shown by F¹ G¹, upon which place the stretchout of the smaller circle C, shown in plan view, as indicated by the small figures on the stretchout line F¹ G¹.

At right angles to F¹ G¹ draw lines indefinitely through the small figures on the stretchout line, as shown, which intersect with lines of corresponding numbers drawn at right angles to E¹ Z from the miter line Y Z at the top, and from the miter line forming the intersections of the two pipes shown by D¹ E¹ at the bottom. A line traced through these points, as shown from N to O and M to L, will be the required pattern for that portion of the elbow shown at F in front elevation, Fig. 99. In obtaining patterns of this kind it is not always convenient to obtain them with the use of the T-square, as just described. In shop practice the stretchout line is placed directly upon the sheet metal, the measurements being taken from the elevation and placed thereon by means of the compasses or dividers.

To illustrate: Let S¹ S² S³ S⁴, in Fig. 99, represent a piece of sheet iron upon which is drawn the stretchout line, as shown from F¹ to G¹, and through the small figures thereon the usual measuring lines are drawn. Extend the stretchout line G¹ F¹ as shown to F². Now measure the distance from the line F¹ F² to where the line 1 cuts the miter line Y Z, and transfer the distance to the sheet metal on the lines 1, 1, measuring from the line F¹ G¹.

Then again measure the distance of the line 2, commencing on the line F¹ F² in elevation, to where line 2 intersects the miter line Y Z, and transfer this distance upon the line 2 2 on the sheet metal, measuring from the line F¹ G¹. In this way all the points will be transferred to the sheet metal, thus completing the pattern N O M L, as shown in Fig. 99. A lap for riveting is allowed, as shown. To obtain the pattern for the opening D¹ E¹, Fig. 99, proceed as follows: At right angles to B¹ E draw the line P R indefinitely, upon which place one-half of the stretchout of the larger circle B, as shown by the small figures from 7 to 7 on the stretchout line P R. It will be noticed, by referring to the plan, that the spaces 1 and 7 of the smaller pipe C intersect the larger pipe B on one line, and is indicated on the profile B, as shown by 1 7′. In the same manner do the spaces 2 6 and 2 6 and 3 5 and 3 5 of the circle C intersect the larger circle B on separate lines, and are indicated on the profile B by 2 6′, 2 6′ and 3 5′, 3 5′ respectively. Therefore are the figures 5′, 6′, 7′, 6′, 5′ placed over the figures 3, 2, 1, 2, 3 on the stretchout P R, corresponding to the numbered spaces on the profile B in plan. Now at right angles to the stretchout line, and through as many points in the stretchout as correspond to the points of the smaller pipe C, intersecting the larger pipe B as shown in plan, drop lines from the stretchout P R, as shown, which intersect with lines of corresponding numbers drawn at right angles to B¹ E or parallel to P R from the miter line D¹ E¹. A line traced through these intersections, as shown by U V X W, will be the required opening to be cut in the larger pipe B, and on to which the pipe F shown in front elevation will miter. At V¹ W¹ in Fig. 99 is shown the method of putting a flange on the elbow C¹ D, placing the flange on the inside of the larger pipe E, either soldering or riveting, as shown.

It will be noticed that P R S T in Fig. 99 represents but one-half of the larger pipe B, as shown in plan. After the half pattern is completed as shown, and the opening U V X W cut out, turn over the pattern on the line P S and trace the pattern on the other side, including the opening U V X W, omitting the lap shown from T to R, which will then be the complete pattern desired.

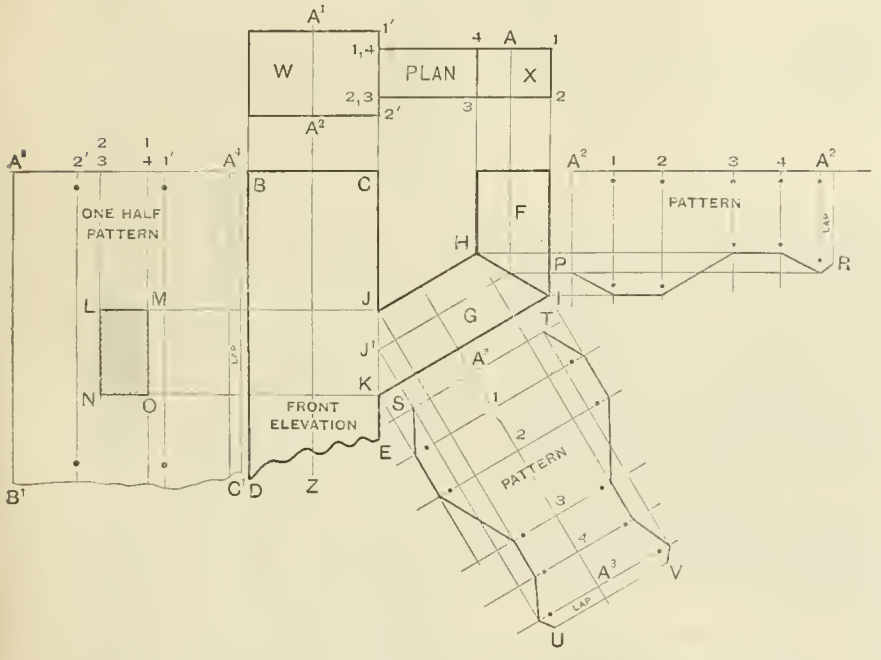


Fig. 101.—*Development of Patterns for a T-Joint Made of Square Pipe.*

THE COUNTRY CORNICE SHOP.

right angles to B¹ E draw the stretchout line H I, upon which place the stretchout of the smaller pipe C, as shown by the small figures on the line H I. Now at right angles to H I, or parallel to B¹ E, drop lines indefinitely from the small figures, as shown, which intersect with lines of corresponding numbers drawn parallel to H I from the miter line Y Z. A line traced through these intersections, as shown from J to K, will be the required miter cut; or H J I K will be the required pattern for that part of elbow shown at G, Fig. 99. A lap is allowed for riveting, as shown. To obtain the pattern for that part of the elbow shown at F, and intersecting the larger pipe E, proceed as follows: At right angle to the line of the pipe E¹ Z draw the stretchout line, as shown by F¹ G¹, upon which place the stretchout of the smaller circle C, shown in plan view, as indicated by the small figures on the stretchout line F¹ G¹.

At right angles to F¹ G¹ draw lines indefinitely through the small figures on the stretchout line, as shown, which intersect with lines of corresponding numbers drawn at right angles to E¹ Z from the miter line Y Z at the top, and from the miter line forming the intersections of the two pipes shown by D¹ E¹ at the bottom. A line traced through these points, as shown from N to O and M to L, will be the required pattern for that portion of the elbow shown at F in front elevation, Fig. 99. In obtaining patterns of this kind it is not always convenient to obtain them with the use of the T-square, as just described. In shop practice the stretchout line is placed directly upon the sheet metal, the measurements being taken from the elevation and placed thereon by means of the compasses or dividers.

To illustrate: Let S¹ S² S³ S⁴, in Fig. 99, represent a piece of sheet iron upon which is drawn the stretchout line, as shown from F¹ to G¹, and through the small figures thereon the usual measuring lines are drawn. Extend the stretchout line G¹ F¹ as shown to F². Now measure the distance from the line F¹ F² to where the line 1 cuts the miter line Y Z, and transfer the distance to the sheet metal on the lines 1, 1, measuring from the line F¹ G¹.

Then again measure the distance of the line 2, commencing on the line F¹ F² in elevation, to where line 2 intersects the miter line Y Z, and transfer this distance upon the line 2 2 on the sheet metal, measuring from the line F¹ G¹. In this way all the points will be transferred to the sheet metal, thus completing the pattern N O M L, as shown in Fig. 99. A lap for riveting is allowed, as shown. To obtain the pattern for the opening D¹ E¹, Fig. 99, proceed as follows: At right angles to B¹ E draw the line P R indefinitely, upon which place one-half of the stretchout of the larger circle B, as shown by the small figures from 7 to 7 on the stretchout line P R. It will be noticed, by referring to the plan, that the spaces 1 and 7 of the smaller pipe C intersect the larger pipe B on one line, and is indicated on the profile B, as shown by 1 7′. In the same manner do the spaces 2 6 and 2 6 and 3 5 and 3 5 of the circle C intersect the larger circle B on separate lines, and are indicated on the profile B by 2 6′, 2 6′ and 3 5′, 3 5′ respectively. Therefore are the figures 5′, 6′, 7′, 6′, 5′ placed over the figures 3, 2, 1, 2, 3 on the stretchout P R, corresponding to the numbered spaces on the profile B in plan. Now at right angles to the stretchout line, and through as many points in the stretchout as correspond to the points of the smaller pipe C, intersecting the larger pipe B as shown in plan, drop lines from the stretchout P R, as shown, which intersect with lines of corresponding numbers drawn at right angles to B¹ E or parallel to P R from the miter line D¹ E¹. A line traced through these intersections, as shown by U V X W, will be the required opening to be cut in the larger pipe B, and on to which the pipe F shown in front elevation will miter. At V¹ W¹ in Fig. 99 is shown the method of putting a flange on the elbow C¹ D, placing the flange on the inside of the larger pipe E, either soldering or riveting, as shown.

It will be noticed that P R S T in Fig. 99 represents but one-half of the larger pipe B, as shown in plan. After the half pattern is completed as shown, and the opening U V X W cut out, turn over the pattern on the line P S and trace the pattern on the other side, including the opening U V X W, omitting the lap shown from T to R, which will then be the complete pattern desired.

Patterns for T-Joints, Square Pipes.

In Fig. 100 is shown the method of connecting two eave troughs into one leader by means of a T-joint. In Fig. 101 is shown the plan and elevation of a T joint, the section of the pipe being square, also the method of obtaining the patterns.

Let B C D E G F, Fig. 101, represent the front elevation of a T joint, made to any given angle, shown by A B C, Fig. 100. Let W represent the plan view of the larger pipe and X the plan view of the smaller pipe; draw the plan and elevation in their proper relative position and let the seam be placed at A¹ in plan for the larger pipe W and at A in plan for the smaller pipe X. Now at right angles to A¹ A² in the plan, Fig. 101, draw lines from the corners of the profile X, cutting the side of the profile W, as shown at 1 4 and 2 3, corresponding to the figures on the corners of the smaller pipe or profile X. As the seam is to be placed at A in the profile X, plan view, as before explained, it will be necessary to obtain this point in elevation from which to obtain the line of the seam on the elbow patterns. Therefore parallel to A¹ Z, Fig. 101, drop a line from the seam A in the profile X, cutting the miter line H I in the elevation. From the intersection obtained on the miter line H I draw a line parallel to the line of the pipe I K, cutting the side of the larger pipe in elevation, as shown at J¹. To obtain the pattern for part of the elbow F proceed as follows: At right angles to A¹ Z draw the line A² A², upon which place the stretchout of the smaller pipe X in plan, commencing at the seam A, as shown by the small figures on the stretchout line A² A².

At right angles to A² A² draw lines indefinitely from the small figures in the stretchout, as shown, which intersect with lines of corresponding numbers draw at right angles to A¹ Z, or the lines of the pipe, from the miter line H I. A line drawn through these intersections, as shown from P to R, will be the required pattern for one arm of

the elbow shown at F. For the pattern of the arm of the elbow shown at G proceed as follows: At right angles to the lines of the pipe K I or J H, front elevation, Fig. 101, draw the stretchout line A^3 A^3 indefinitely, upon which place the stretchout of the smaller pipe X, shown in plan, commencing at the seam A, as shown by the small figures upon the stretchout line A^3 A^3. At right angles to A^3 A^3 and through the small figures draw lines indefinitely, as shown, which intersect with lines of corresponding numbers drawn at right angles to the lines of the pipe J H or K I from the miter line H I at the top, and J K at the bottom. A line drawn through these intersections, as shown by S U V T, will be the required pattern for the arm of the elbow shown at G. To obtain the size of the opening J K which will be cut on to the larger pipe shown by B C D E in elevation, Fig. 101, proceed as follows: At right angles to A^1 Z draw the stretchout line A^4 A^5, upon which place the stretchout of half of the profile W, shown in plan, commencing at the seam A^1, as shown by the small figures upon the stretchout line A^4 A^5, the numbers 3 2 and 4 1 on the stretchout A^4 A^5 corresponding to the numbers showing the intersections of the smaller pipe X on the side of the larger pipe W. At right angles to A^4 A^5 drop lines from the small figures, as shown, which intersect with lines of corresponding numbers drawn at right angles to the lines of the pipe B D or C E from the miter line J K, as shown. A line drawn through these intersections, as shown by L M N O, will be the opening required. A lap is allowed for riveting, as shown. It will be noticed that A^4 A^5 B^1 C^1 represents but one-half of pattern of the larger pipe shown by W in plan. For the entire pattern simply turn over the half pattern on the line A^5 B^1, transferring the dots, as shown, which indicate the bends, and omitting the opening L M N O and the lap for riveting. It should be understood that by placing the elbow F G, Fig. 101, on the other side of the pipe D E C B, a Y joint would be the result, the same as shown in Fig. 99, with the exception that the pipe is round in Fig. 99 and square in Fig. 101.

[THE END.]

The Iron Roofing Trade.

The lively movement in the iron and steel roofing trade caused by orders being placed for shipment to Western points before the recent advance in freight rates has quieted down, and the business is as dull as other branches of the iron and steel industry. Recently quite a number of concerns have engaged in the manufacture of specialties. The Cambridge Roofing Company, Cambridge, Ohio, have added a lot of new improved machinery for the manufacture of galvanized conductor pipe, and are doing a fair business in this line, and other manufacturers of the same material are kept busy, thus helping to keep up a steady demand for galvanized sheets, which are now growing scarce in the market. The demand for roofing sheets and corrugated iron continues fair, and some makers are seeking places where supplies of sheets can be secured, but the majority have enough stock on hand for their requirements and are not inconvenienced by the shortage caused by stoppage of sheet mills due to the coal miners' strike. The Berger Mfg. Company, Canton, Ohio, have recently introduced many new designs in steel ceilings and siding, and other sheet metal working concerns are turning their attention to this class of work.

FLASHINGS.

FRED. HARTMAN, 143 Wells street, Chicago, is to furnish the galvanized iron cornice work for the residence of Charles Niemann, Diversey place; flat building of Dr. G. H. Fricke, Halsted street and Buckingham place; store and flat building of A. H. Rendtorff, North avenue, and Casaretto flats, West Indiana street.

A RECENT ISSUE of the *Times*, published at Bethlehem, Pa., contains an article reviewing the history of the Slatington-Bangor Slate Syndicate of Slatington, Pa. Among other things the article states that the shipments of the company for May of this year were 141 carloads, containing 8336 squares of roofing slate, making a total since January 1 of 20,421 squares. For the corresponding period of last year 10,806 squares were shipped by the syndicate. While the situation is not altogether encouraging there is a fair demand for slate, which indicates more or less building activity in some sections of the country. Nearly all the quarries of the syndicate are running on full time, and the outlook is reported good for a large trade this season.

Building Trades Exhibition a Success.

The first annual Chicago Building Trades and Material Exhibition, which has just closed at the Institute of Building Arts, 63 to 69 Washington street, Chicago, was a success in every particular. A large and constant attendance of interested visitors attested the appreciation with which the exhibition was received by the public, and the 200 exhibitors expressed themselves as very much gratified with the work accomplished. The exhibits covered a wide range of building materials and devices, embracing everything necessary to the health, comfort and convenience of man in connection with the construction of buildings.

Exports of copper during April and in the ten months ending April 30 are stated as follows in the last monthly report of the Bureau of Statistics:

	Ore.	
	1894. Tons.	1893. Tons.
In April	291	3,673
Ten months	23,302	33,008

	Ingot.	
	1894. Lbs.	1893. Lbs.
In April	11,055,135	3,084,407
Ten months	168,898,854	24,411,939

The distribution of ingot during the ten months was as follows:

	1894. Lbs.	1893. Lbs.
To United Kingdom	61,069,038	2,308,259
To Germany	21,164,702	2,863,142
To France	26,619,864	9,769,766
To other Europe	53,427,139	9,261,520
To other countries	617,311	209,252

The Bronson Supply Company, 72 Beekman steet, New York, contemplate establishing a London office for supplying the European and British colonial trade with their line of House Furnishing Goods, and at the same time they are making preparations to represent manufacturers of kindred lines of Hardware. The articles in which they intend establishing a foreign trade will include, besides Hollow Ware, Stamped and Pieced Tinware, Copper Ware, Hardware novelties in the line of Kitchen and Household Utensils, Wooden Ware, Wire Goods and Plated Ware. They will also handle a limited number of standard articles, such as Skates, Locks, Oil, Gas and Gasoline Stoves. The Bronson Supply Company request that manufacturers of the above lines of goods who wish to negotiate for representation abroad communicate with them.

The Dry Closet System.

The Board of Health of Syracuse, N.Y., recently held a meeting to hear reports on the dry closet systems used in their schools, which have been carefully investigated by Health Officer Doctor Totman and a committee from the Heating, Ventilating and Sanitary Association of Syracuse, consisting of William A. Tobin, R. C. McClure, F. H. Moore of the Howard Furnace Company, B. Joseph O'Donnell, E. C. Moses of the J F. Pease Furnace Company, E. P. Bates and Edward Joy. The association's committee came before the board with a statement of what they found in an investigation of Montgomery and other schools of the city.

"Montgomery School.—The vaults for the so-called dry closet system were filled with a putrid mass of night soil and liquid 20 inches deep. Over each of these vaults, two in number, are located the two classrooms of the primary department, each containing 48 sittings and occupied by about 80 scholars. Each of these two rooms are provided with two ventilating exits in the shape of face plates located in the floor. These exits, which open into foul air shafts or chambers to ditch, are connected to and open into the said vaults. In each case one of these face plates exits opens into the foul air chamber directly over the putrid mass of liquid night soil above referred to. All the shafts for drawing foul air from the classrooms of the school open into these two vaults. We found upon examination that in the rooms on the second floor, over the vaults, the foul air ventilating exits were operating contrary to the intention and that they were throwing foul air into the rooms instead of exhausting it. Some of the air being thrown into the rooms had passed through the vaults hereinbefore mentioned. According to statements made by persons in the building these conditions have existed more or less during the past season. The teacher stated that they have been obliged to open the windows to obtain pure air. We were informed by the janitor that he had attempted to burn out the excreta deposits with the aid of oil. He stated that he had used 30 gallons of oil in one vault without success and had failed to consume the matter in the other vaults, using more or less oil."

Their statement of the condition at other schools showed but little difference, and on motion of Commissioner Schwarz the Montgomery School in its present condition was declared a nuisance, and the Health Inspector was ordered to abate it.

The official statistics of imports and exports for the ten months of the fiscal year ending April 30, 1894, show a falling off of $123,500,000 in imports into the United States, as compared with those of the corresponding period of last year. Exports, in the same time, increased over $53,500,000. The figures given are as follows: Imports in 1893, $354,213,427, and in 1894, $230,719,588 Exports in 1893, $701,036,375, and in 1894, $754,606 522.

STOVE TRADE NOTES.

The Richmond Stove Company,

with office and works at Twenty-fifth and Main streets, Richmond, Va., have issued an exceedingly attractive volume of nearly 100 pages, relating to cook stoves, ranges, heaters, hollow ware, grates, fenders, &c. The pages are of large size, permitting the use of cuts of liberal proportions. The descriptive text points out the important features of construction and gives the various sizes in which the goods are made, the dimensions of ovens, diameter of pipe required and prices. The printing is in colored ink, while in connection with some of the heating stoves red is employed to indicate the glow of the fire through the mica sections. The company have made some important additions to their line since the last issue of their catalogue, and the statement is made that in the construction of the goods they use iron made from native ores. Among the goods shown may be mentioned the Improved New Lee cook stove, the Kenmore, New Patron, Piedmont, Seminole, Dispatch, New Gordon, Wenonah and the Virginia Air Tight. The ranges are represented by the Richmond, a substantial six-hole construction of attractive ornamentation made in various styles and sizes; the Lee, shown in several varieties; the Favorite, for brick setting; the Roanoke, Dorcas and Ariel. The heaters include the Sultan, a new direct draft self feeder for coal; the New Avondale; the Melrose, a cottage parlor for wood or coal; the Radiant, an attractive Franklin; the Comfort, a neat Todd for wood; the New Dixie, a box stove; the Longdale, a heavy cannon; the Iron King, shown with and without heating drum; the Richmond Oak, a new heater made in five sizes for wood or coal, and the Pluto, a cannon stove made in four sizes. The closing pages of the catalogue are given up to illustrations and prices of grates, fenders, hollow ware, fire brick, &c. An interesting feature is the presentation of skeleton cuts of a cook stove and range, the various parts being numbered in such a way as to facilitate the ordering of repairs. The binding of the catalogue is in embossed covers, the design appearing in old gold and green upon a wine colored ground.

ODD PLATES.

NEGOTIATIONS have been in progress for some months between Emerson McMillin & Co., 40 Wall street, this city and certain of the large vapor and gas stove manufacturers of Cleveland, St. Louis and Chicago, looking to the acquisition of these properties by the United Vapor & Gas Stove Company, who have recently been organized under the laws of the State of Illinois, with a capital stock of $8,500,000. The negotiations are not yet concluded, but the progress of affairs will be watched with interest by the trade.

QUITE a number of Western stove foundries have been obliged to suspend operations recently because they ran out of coke. The coal miners' strike continued long enough to affect these foundries, but it was a much longer pull than had been expected.

THE FAVORITE STOVE & RANGE COMPANY of Piqua, Ohio, are calling attention to their specialties offered under the name Favorite, by means of a little pamphlet entitled "Col. Tompkins' Story." This is told in verse, illustrated by means of numerous engravings. The printing is in colors, and the style and make up of a pleasing character. The last page of the cover gives a bird's-eye view of the company's works at Piqua.

THE STOVE MOUNTERS of Philadelphia have formed a local union under the jurisdiction of International Union No. 6, and have elected H. G. Halbe president, Jacob P. Rothfuss treasurer, and James P. Donnelly secretary.

THE DETROIT STOVE WORKS, Detroit, Mich., have just made a shipment to Frankfort, Germany, of 35 Jewel base burners, and have an order on file for future shipment of goods to Constantinople.

DR. EDWARD KIRK, 1208 Vine street, Philadelphia, Pa., publishes a neat pamphlet on "Constructing a Cupola," which contains much practical information for those who have need of such a furnace. The pamphlet will be sent free on application to Dr. Kirk.

THE THATCHER FURNACE COMPANY are now settled in their new five-story brick building at 240 Water street, where they enjoy greatly improved business facilities as compared with their old location at 32 Peck slip. On the first and second floors of the building are found an excellent display of furnaces and hot water heaters, while the third floor is set apart for ranges in portable form and brick set. The fourth and fifth floors are given up to workshop purposes. The entire building is lighted by electricity, over 200 incandescent lamps having been installed. During the past week the company have shipped to their agents in the West many carloads of furnaces and ranges.

C. EMRICH of Columbus, Ohio, has recently made some improvements in connection with his Brilliant Florence Round Oak, which is offered the trade in five sizes. He has increased the hight of this stove by extending the drum about 15 inches. The nickel trimmings have also been altered in some respects, giving, it is claimed, much more satisfactory results. Two sizes of a new four-hole range, made right or left hand, have been brought out and the Prize Florence four-hole cook stove, as well as the Queen Florence, have been remodeled. The concern are now fully equipped with a complete line of medium priced stoves of new pattern and modern design.

CHARLES E. COLEMAN, representing Eugene Munsell & Co., 218 Water street, New York, has recently returned from a six weeks' trip through the Eastern and Western States, where he called upon stove dealers, hardware jobbers and manufacturers of electrical goods. We understand that Mr. Coleman will soon visit his many friends in the stove trade in the New England States and also in the State of New York.

THE PORTLAND STOVE FOUNDRY COMPANY of Portland, Maine, have brought out a new medium priced range known as the Ideal Atlantic. It is of attractive appearance, embodies the modern features of convenience and utility and is designed for a leader, to sell in the same class as the highest grade goods, but at a lower price.

THE MAGEE FURNACE COMPANY, 32 to 38 Union street, Boston, Mass., are distributing a unique advertising novelty entitled "The Great Columbus Egg Puzzle." It consist of a round pasteboard box, about 2¾ inches in diameter and ¾ inch deep, in the bottom of which is a small hole. The box contains a wooden egg of such a size that it will go partially through the hole. The puzzle is to make the egg stand in an upright position in the hole without touching it. The bottom of the box carries an inscription calling attention to the puzzle and also to a new range which the company have brought out, known as the Magee Grand. This is referred to as "the finest cooking apparatus that has ever been made." The cover of the box is embellished with a colored picture in which Columbus is a prominent figure.

STUMPF & THIELE, 19–21 North Tennessee street, Indianapolis, Ind., have issued an illustrated circular showing the Tropic base heating steel furnace, for use in residences, churches, halls, stores, &c. It is made in three sizes, known respectively as Nos. 25, 31 and 37. The manufacturers also call attention to their Sanitary school room heater and ventilator, of which two sizes are made. The claim is made that by its use a "constant change of air is obtained in the room by the introduction of a volume of fresh air from outside through the heater, and the ejection of foul air from the room, taken from the lower currents in the room through the ventilators."

THE SANFORD HEATING COMPANY, represented by L. V. Sanford, 113 Beekman street, this city, have been appointed agents for the sale of the goods manufactured by the Kelsey Furnace Company of Syracuse, N. Y. The furnaces of this concern have established a gratifying reputation in the trade by reason of their durability, large, heating surface and economy of fuel. Mr. Sanford has been brought up in the stove business and is considered an authority on matters pertaining to heating and ventilation.

THE MARCH-BROWNBACK STOVE COMPANY of Pottstown, Pa., have just placed on the market a new soft coal furnace as an addition to their well-known line of Crown furnaces. The new furnace consumes its own smoke, this being effected by means of a current of air which is taken in at the front

of the furnace and distributed in the fire. The furnace is made in the three larger sizes and two styles, portable and brick set.

Evans & Co., formerly located at Peck slip and Front street, have leased the building 119 Beekman street, this city, where they will carry a full line of stoves and ranges manufactured by the Lebanon Stove Works, at Lebanon, Pa., for whom they are agents. The firm also represent Luther & Lederhos of this city, and will carry a full line of their gas stoves and ranges.

Manager Hull of H. Rendtorff & Co., Chicago, reports a sale of a carload of stoves for immediate shipment, and all of one kind. There is no doubt about it, for he exhibits the documents to prove it. This interesting event is mentioned because it had been supposed that carload orders were events of the misty past.

The Magee Furnace Company, Boston, Mass., are sending the following letter to their patrons: "J. Q. A. Butler having severed his connection with our New York branch, our business there will be conducted in the future by J. M. Sweeny as manager, at 242 Water street, as heretofore. Wm. H. Mason will continue in charge of the retail furnace department."

"One Hundred From Many Thousands," is the title of the Eastern edition of a pamphlet of testimonials relative to Splendid and Stewart stoves, just issued by the Fuller & Warren Company of Troy, N. Y. There are 30 pages of letterpress wholly devoted to these letters, which come from dealers in the Eastern section of the country who have handled the goods named. The communications are of a highly complimentary character and indicate in no small degree the measure of success which the Stewart and Splendid stoves have achieved.

It may have been accidental, but it looked intentional. At all events the buyer thinks so if he now knows the circumstances. During the recent cold spell, which seems ever so long ago, the writer dropped into a store for the sale of oil heaters. One of them was in full blast. Resplendent in nickel, and with the glowing flame showing through the large mica panes, it was a sight to cheer the eyes on such a chilly morning. In dropped a customer who was attracted by the beauty of the stove, and then took a position in front of it so that he could more readily examine its construction. "Jerusha!" said he, "does it throw out that much heat?" "Yes, always," said the gratified salesman, proceeding to dilate upon its superior powers of air circulation. The customer ordered one forthwith and instructed the salesman to send it to his house immediately to comfort his wife, who didn't want to buy more furnace coal and was trying to brave out the discomforts of the late spring. The cause of the buyer's enthusiasm was discovered after he had gone out. He had been standing immediately in front of a register through which a Sturtevant blower was forcing heated air with all the energy of which it was capable, and had evidently assumed that the heat he felt was due to the terrific power of the stove before him. The beatific smile on the salesman's face when he perceived the combination that had so signally aided him was a sight to make a fallen angel weep.

Rathbone, Sard & Co. have received in their Chicago office, corner of Wabash avenue and Randolph street, the originals of the letters patent covering the construction and design of their Acorn radiator. These patents are dated January 23, 1894, and March 13, 1894, the first covering design and the second construction. They take pleasure in showing these patents to those who are interested in the matter. They will issue licenses to other manufacturers who may wish to use the principle on which this stove is constructed, but retain the design exclusively for their own stoves.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

The Board of Supervisors of Ontario County, N. Y., have passed an appropriation of $25.000 for the erection of a Sheriff's residence and jail, which will have a system of heating and plumbing.

The contract for steam heating of the new school house at Dovlestown, Pa., has been awarded to Thomas Craig of Trenton, N.J. The contract price is $1690.

The contracts for the heating, plumbing and ventilating of the two new school buildings at St. Paul, Minn., have been awarded by the Board of Education. The board awarded the contract for the plumbing to W. W. Sykes & Co. for the Van Cleve and Douglass buildings at $1432 each. The contract for the heating and ventilating of the Van Cleve Building was given to Pond & Naset for $5200, and for the Douglas Building to Turnsted & Moore for $5698.

Edward H. Barry has been awarded the plumbing contract for the new Gaulin Avenue School House at Woonsocket, R. I.

The Board of State Prison Commissioners of the State of Montana will, until June 28, 1894, receive sealed proposals and bids to equip the Eastern State Prison at Billings, Montana, with steam heating plant. All proposals must be addressed, "Board of State Prison Commissioners, Helena, Montana," and marked, "Sealed Proposals and Bid, by (giving the name of the bidder)." A bond of $5000 will be required of the successful contractor.

The town meeting of Springfield, Mass., has appropriated $1000 for heating the Town Hall.

H. A. R. Dietrich, Bethlehem. Pa., is putting the heating plant in A. L. Colby's new building, Fountain Hill. Mr. Dietrich is also at work on plans for work on several new buildings, and his Hellertown works are busy turning out boilers.

Orange, Mass., is to build a new school house to cost $24 700, exclusive of the heating and plumbing. James A. McKenna has the contract.

Sealed proposals will be received by T. H. Titus, secretary of the Board of Trustees of the Minnesota State Hospitals for the Insane, at the West Hotel, Minneapolis, Minn., until 1.30 p.m., July 6, 1894, for a plant for heating and ventilating the northeast wing of the Fergus Falls State Hospital for Insane; plans and specifications to be submitted by each bidder. Sealed proposals will also be received for plumbing said building. He will also receive at the same time and place bids for heating and ventilating the Administration Building for the Rochester State Hospital for Insane.

The contract for supplying the ventilating apparatuses and the steam disinfecting apparatus for the Contagion Hospital has been awarded by the Sanitary Committee of the city of Harriaburg, Pa., to the Raymond & Campbell Mfg. Company of Middletown, Pa. The steam for the disinfecting apparatus will be supplied from a No. 2 Lindemuth steel boiler.

The Alberene Stone Company, agents for the Smith & Anthony Company, 217 Lake street, Chicago, report the following new buildings in which the Hub warm air furnaces are to be placed: Five houses of F. H. Kirkham, Sunnyside avenue and Robey street, Ravenswood; two houses of D. R. Cannon, Ravenswood; residence of H. Neugard, Rogers Park; residence of D. J. Slayton, Argyle Park.

J. J. Wade & Son, 276 Dearborn street, Chicago, are to do the plumbing, gas fitting and sewerage in the Kent Building, corner of Franklin and Van Buren streets; also the plumbing, gas fitting and sewerage in the Hale Building, corner of State and Washington streets. The Wade system of sewerage is to be used in each of the buildings.

Among the contracts recently taken by the John Davis Company, 69 to 79 Michigan street, Chicago, can be mentioned the following: Steam heating plants for the new school building on Thomas street, and warehouse of A. E. Kent & Sons, Franklin and Van Buren streets; power plant for the New England Engineering Company's electric light plant, at Edgewater. The company have also furnished supplies for the water works at Ottawa, Ill., and several carloads of pipe to be used on the Chicago drainage canal.

Kehm Bros. & Mertz, 289 East Kilzie street, Chicago, are to install a steam heating plant for the Illinois Condensing Company, Forty-seventh street and Vincennes avenue.

Proposals for heating the North School House in independent school district of Indianola, Iowa, by steam, will be received by E. W. Hartman, secretary Board of Directors, Indianola, Iowa, until June 22, 1894.

Stoneham, Mass., has purchased and will remodel the Armory Building and put in a steam heating plant.

Vicksburg, Miss., is to have a new $10,000 school building, with a modern ayatem of heatiug and ventilation.

The March-Brownback Stove Company of Pottstown, Pa., are supplying one of their style B No. 30 Crown steam heaters for William Blackburn's hotel, at Ambler, Pa. Grant, Jenkins & Co. of Lonsdale, Pa., are installing the heating plant.

Among the contracts recently taken for plumbing, gas fitting and sewerage by C. J. Boyd, 4725 Union avenue, Chicago, can be mentioned the following: Flat building of Miss McConvill, Emerald avenue and Forty-third street; flat building of D. Lynch, Union avenue and Forty-fourth street; flat building of John Sampson, Aberdeen and Fifty-fourth streets; flat building of James Kennedy, Sangamon and Sixty-fourth streets.

J. H. Roche, 210 Thirty-first street Chicago, has the contract for the plumbing, gas fitting and sewerage in the flat

building of Inspector Nicholas Hunt, Monroe and Fifty-eighth streets.

J. J. Doyle, 6040 Halsted street, Chicago, is to furnish the plumbing, gas fitting and sewerage in the eight-flat building of H. C. Saxe, Halsted and Sixty-first streets.

Proposals will be received until June 20 by the trustees of St. John's Church, Michigan, Ind., for steam heating and also for water heating for St. John's Church and St. John's Parochial School buildings.

The Manufacture of Briquette Fuel.

At a recent meeting of the Institution of Civil Engineers a paper on this subject was read by William Colquhoun. The paper contained a description of the various English and Continental methods of agglomerating slack coal, which has now become an important and increasing industry and opens up an outlet for large quantities of small coal hitherto lost on the pit bank or in the workings. Various agglomerating agents are detailed and their local advantages discussed; the characteristics of good pitch derived from coal tar render that agent, however, in every way the most suitable. By the use of from 8 to 9 per cent. of pitch, slack coal may be agglomerated into a form eminently suitable for storage purposes, water proof, incapable of deterioration on exposure, of cohesion greater than the large coal from which it is derived, and, finally, having calorific qualities nearly equal to large coal. In support of the latter contention the author cites the results of three experiments with English briquettes, which gave 8.41 pounds, 8.77 pounds and 8.99 pounds, respectively, as the weight of water evaporated from and at 212° F. per pound of fuel. The average evaporative power of several of the best Welsh steam coals was 9.33 pounds. Careful experiments made by Mr. Marié on the Paris, Lyons & Mediterranean Railway gave as corresponding figures for three descriptions of French briquettes, 8.88 pounds, 9.15 pounds and 8.68 pounds, respectively.

The mechanical preparation of the coal used in briquette manufacture receives more attention on the Continent than in England, particularly in regard to the washing and subsequent drying of the slack. These operations are necessary in order to render the poorer coals serviceable for the manufacture. The draining and drying appliances in use are described, particularly those of Jacoby of the Molière Collieries, and of Biétrix, the latter being described in detail and instances given of the working cost. The coal and pitch are intimately intermixed by two methods, known respectively as the melted and dry pitch processes, the pitch by the former being melted, sometimes with additions of common tar, prior to its addition to the coal, and by the latter being ground up with the coal in a dry state. Several examples are given of the procedure in each case. In both instances the mixture of coal and pitch is subjected to the action of heat until each particle of coal is covered with a film of melted pitch, and so rendered fit for compression into blocks. In this state the mixture or paste contains from 3 to 5 per cent. of water in order to facilitate the sliding of the particles of coal one on the other during compression.

The machines for compressing the paste are roughly divided into three classes, irrespective of the nature of the power employed. These classes are: 1. Single compression machines, illustrated by detailed descriptions of the Mazeline, Stevens and Dupuy presses. 2. Machines compressing on both sides of the briquette, such as those of the Middleton, Biétrix and Veillon. 3. Machines acting by the tangential pressure of rolls, like that of Fouquemberg and those of the sausage machine type, such as the Bourriez press. Briquettes hot from the press have an inconsiderable cohesion and have to be treated with care in stacking and loading, and arrangements made to keep down the cost of labor. Costs were given of making briquettes in works in England, in the North of France and in Belgium, the cost of labor, fuel, supplies and maintenance, not inclusive of the cost of material agglomerated, being 2 shilling and 1½ pence, 1 shilling and 9 pence and 2 shillings and 6 pence, respectively.

Instances were cited of the suitability of the same process for the agglomeration of charcoal dust, sawdust, coke breeze, friable iron ores and cement.

Southern Pig Iron Freights.—The Queen & Crescent Route has issued east bound pig iron tariff No. 6, effective June 15, giving rates on pig iron in car load lots from Southern furnaces to the following points:

To	From Dayton and Rockwood, Tenn.	Chattanooga, Tenn.	Rising Fawn, Ga., and Fort Payne, Ala.	Birmingham district.
Connecticut (all points).	$5.00	$5.25	$5 50	$5.50
Wilmington, Del	4.27	4 27	4.52	4.52
Maine (all points)	5.00	5.25	5.50	5.50
Baltimore, Md. (rail and water)	3.54	.....	3.50	3.50
Baltimore (all rail)	4 00	4.01	4.11	4 11
Washington, D. C	3 76	3.76	4.01	4.01
Massachusetts (all points; all rail)	5.00	5.00	5.50	5.50
Boston (rail and water)	3.89	....	3.85	3.85
New Hampshire (all points)	5.00	5.25	5.50	5.50
Elizabethport, N. J.	4.62	4.62	4.87	4.87
*Jersey City (rail and water)	3.54	.....	3.50	3.50
Jersey City (all rail)	4.76	4.76	4.87	4.87
Albany, N. Y	4.44	4.69	4 94	4.94
Elmira, N. Y	4 00	4.25	4.50	4.50
Lockport, N. Y	3.56	3.81	4.06	4.06
†New York (rail and water)	3 54	.....	3.50	3.50
New York (all rail)	4.76	4.76	4.87	4.87
Rochester, N. Y	3.56	3.81	4.06	4 06
Syracuse, N. Y	3.80	3.69	4.30	4 30
Troy, N. Y	4 44	4.05	4.30	4.30
Utica, N. Y	4.20	4.44	4.70	4.70
Allentown, Pa	4.41	4.41	4 52	4.52
Chester Pa	4.27	4.27	4.52	4 52
Harrisburg, Pa	3.56	3.56	3.81	3 81
Lancaster, Pa	3.91	3.91	4.16	4.16
Philadelphia (rail and water)	3.54	.....	3.50	3.50
Philadelphia (all rail)	4.41	4.41	4.52	4.52
Pottsville, Pa	4.32	4.32	4.57	4.57
Reading, Pa	4.27	4.27	3 52	3.52
Scranton, Pa	4.20	4.45	4.70	4.70
Rhode Island (all points; all rail	5.00	5.25	5.50	5.50
Providence, R. I. (rail and water)	3.89	....	3.85	3.85

*In addition to above charges the cost is as follows: In lots of 50 tons and less, 60 cents per ton; over 50 tons, 50 cents per ton.
†The above rates cover pier delivery only. Additional charge within lighterage limits is as follows: In lots of 50 tons and less, 60 cents per ton; over 50 tons, 50 cents per ton.

The all rail rate on the Louisville & Nashville Railroad is $5 39 from Chattanooga to Boston. The rate from Big Stone Gap, Va., to Harrisburg is $3.06. To Newark, N. J., it is $4.87 from Birmingham, $4.62 from Chattanooga, and $4.12 from Big Stone Gap. The all rail New York rate is $5.10 from Birmingham, $4.85 from Chattanooga and $4.35 from Big Stone Gap, Va. The all rail rate to Philadelphia is $4 52 from Birmingham, $4 41 from Chattanooga, and $3.91 from Big Stone Gap.

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TRADE REPORT.

The Iron Market.

The question which is foremost with the trade is whether the settlement of the Coal and Coke strikes when effected will lead to a relapse. The principal argument in favor of the maintenance of a range of prices higher than that of spring is that stocks have been pretty well cleaned up. In Iron as in other staples the country was never so bare.

A second point usually raised is that costs have advanced. That is true, but unfortunately the advance is not very large. It seems pretty certain that Coke for delivery during the second half of this year has been sold at $1.25. Since the majority of furnacemen will find their low priced contracts at an end soon, it looks as though that figure might be established.

A third argument is that during the troubles a good deal of work has been postponed, for which material must be bought. We are inclined to believe that this is overrated, since a prolonged stoppage generally kills a good deal of business outright.

Thus far there are few indications to show how matters will turn. For delivery during the next three or four months $11 @ $11.25 is being asked for Bessemer Pig in the Valleys. But buyers have not worked themselves up to that pitch yet, and the situation is not clear. The prices at which Bessemer is held have encouraged preparations to start some outside idle plants and have caused some furnaces which run on Foundry Iron usually to switch off on Bessemer. This looks as though there is a fair profit in the latter.

Chicago appears to be the most active market in some of the leading lines. Our correspondent notes sales of about 20,000 tons of local Coke Foundry, and states that there has been a good deal of activity in Bars. A number of season contracts have been placed, but at low prices.

Throughout the East the demand in every line continues exceedingly slow. In fact, the indifference of buyers in the face of threatened scarcity has been phenomenal. It looks as though no movement in values can be expected until high temperatures in Washington have driven our legislators home.

In the New York market the demand continues moderate, and is covered quite readily at old prices. The new rates of freight go into effect on the 15th. The rail and water rates to leading points from Southern furnaces are still very low. We quote standard brands $12.50 @ $13 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No 4 (Foundry Forge) is $9.75 @ $10.25.

Advices from Philadelphia indicate that in that market there is a pretty fair demand for low grade Irons at about $10.25 @ $10.50 and of standard brands of Foundry No. 2 X at $11.50 @ $11.75, but it is very hard to get beyond these limits, notwithstanding the comparative light supply and the higher cost incident to higher freights. Consumers, however, show no desire to buy in excess of their own requirements, for which reason sellers are not crowding the market, leaving it to later developments to decide whether prices shall be advanced or not. Quotations for deliveries at Philadelphia or nearby points are about as follows :

Standard No. 1 Foundry X....	$12.50 @ $12.75
Standard No. 2 Foundry X...	11.50 @ 11.75
No. 2 Plain.....	10.75 @ 11.00
No. 1 Soft....	11.50 @ 11.75
No. 2 Soft....	10.75 @ 11.00

The special feature of the week in the Chicago district was the marked activity in local Coke Iron. Sales aggregated close to 20,000 tons, and a heavy inquiry continues. The improvement is not ascribed by dealers to any increase in consumption, but to the general anticipation by foundrymen of higher prices on account of the scarcity of fuel and the cleaning up of Pig Iron stocks. They are anticipating their wants much more freely than at any time for the past two years. Furnace companies are, however, not disposed to sell as freely as foundrymen would buy. They are limiting deliveries to the remainder of their care, and in many cases are endeavoring to cut down the quantities desired. Prices are very firm and in some cases an advance is asked and obtained. Southern Coke steadily grows scarcer and prices are stronger. Quotations on Southern brands are now made only on carload lots for immediate delivery. The furnace companies are not disposed to sell for delivery far into the future, in view of the expected increase in cost of production and advances in freight rates. Quotations are given as follows for cash:

Lake Superior Charcoal.....	$15.00 @ $15.50
Local Coke Foundry, No. 1...	11.25 @ 11.50
Local Coke Foundry, No. 2...	10.50 @ 11.00
Local Coke Foundry, No. 3...	10.00 @ 10.50
Local Scotch.....	11.50 @ 11.75
Ohio Strong Softeners No. 1..	13.00 @ 13.50
Southern Silvery, No. 1.	..... @ .....
Southern Silvery, No. 2.....	..... @ .....
Southern Coke, No. 2..... ...	10.00 @ 10.35
Southern Coke, No. 3.....	9.75 @ 10.00
Southern, No. 1, Soft.....	10.25 @ 10.50
Southern. No. 2, Soft.....	10.00 @ 10.25
Tennessee Charcoal, No. 1....	.... @ .....
Tennessee Charcoal, No. 2....	.... @ .....
Alabama Car Wheel.....	17.50 @ 18.00
Jackson County Silvery.....	15.00 @ 16.00

The Pittsburgh market is reported as being absolutely featureless, there being no demand for spot Iron, and nothing doing in the direction of contracts for late delivery. Mill and Foundry Irons are very dull in demand, but prices continue firm. A sale is noted of 100 tons No. 1 Foundry at $11.50, and one of 100 tons No. 2 Foundry at $10.75, Pittsburgh. For close delivery the following prices are ruling:

No. 1 Foundry..	$11.50 @ $11.75, cash
No. 2 Foundry.....	10.75 @ 11.00 "

There is a stronger undertone in the Cincinnati market. While there has been little more than a jobbing demand during the week it was more general in this district and from the East and supplies are so much reduced that many of the Southern furnaces are not offering the grades most in demand at any price, and while they have generally sold Nos. 1 and 2 Foundry Coke Iron to the extent of the demand at previous prices, they demand an advance on No. 3 Foundry. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke, No. 1.....	$10.25 @ $10.50
Southern Coke, No. 2.....	9.25 @ 9.50
Southern Coke, No. 3.....	9.00 @ 9.25
Ohio Soft Stone Coal, No. 1....	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2....	14.00 @ 14.50
Lake Superior Coke, No. 1.....	12.50 @ 13.00
Lake Superior Coke, No. 2.	11.50 @ 12.00
Hanging Rock Charcoal, No. 1..	17.00 @ 17.50
Hanging Rock Charcoal, No. 2..	16.50 @ 17.00
Tennessee Charcoal, No. 1.....	13.00 @ 13.50
Tennessee Charcoal, No. 2.....	12.00 @ 12.50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable.....	16.25 @ 16.75

An increasing scarcity in No. 1 Foundry, with a tendency to advance the price of this grade, is the only feature of interest in the St. Louis Pig Iron situation. Nos. 1 and 2 Soft Irons are also hard to obtain, but prices are unchanged. Quotations as follows for cash, f.o.b. cars St. Louis :

Southern Coke, No. 1 Foundry.....	$11.00 @ $11.25
Southern Coke, No. 2 Foundry	10.00 @ 10.25
Southern Coke, No. 3 Foundry.	9.75 @ 10.00
Southern Car Wheel.....	17.00 @ 18 00
Lake Superior Car Wheel..	16.25 @ 16.50
Ohio Softeners.....	14.25 @ 14.50

Metal Market.

Pig Tin.—The consumptive demand for Pig Tin, like that for other metals, has been very tame of late, while port statistics show more or less considerble addition to the surplus supply. Arrivals at foreign ports have also been quite heavy, and while more or less shifting of stock has taken place the visible supply for this country and Europe is kept at about 19,000 tons, or above the average. In other words, there is abundance of Tin on the market. Moreover, there is a growing conviction that the speedy passage of the new tariff bill, which abolishes the duty on Pig Tin, is certain. These causes combined have served to depress prices, which have dropped during the week on wholesale lots to 19.65¢. Jobbing prices for small lots of Straits Pig are still quoted at 21¢ @ 21½¢ ℔ lb, but the majority of sales have probably been made of late at the lower figure.

Copper.—Recent large sales of Lake Ingot will, it is estimated, involve 25,000,000 lb. Business is, however, again on a very moderate scale, and values are more or less irregular. Nevertheless prices for retail quantities generally maintain the former level of 10½¢ ℔ lb for Lake Ingot.

Sheet Copper.—Although the volume of inquiries for Manufactured Copper has been appreciably larger during the week, but few of them have as yet crystallized into definite business. Purchasing by consumers still continues to be of a very commonplace character and decidedly below the average for this season. Users of Sheet Copper are, like others similarly placed, buying from hand to mouth as the necessities of their daily business dictate. Individual orders placed with manufacturers and dealers are accordingly for

unusually limited amounts. Stocks in consumers' hands are insignificant, and conditions are favorable for a remarkably active demand for the material later on as general business conditions improve. Prices for small quantities of Sheet Copper remain on a basis of 15¢ ℔ lb, with no discount.

Pig Lead.—Buying has not been free or general, but enough business has passed to give the market quite a steady tone. Small lots of American Pig from store fetch in the neighborhood of 3⅞¢ ℔ lb, although a shading of ⅛¢ from that figure has been conceded to small buyers.

Lead Pipe and Sheet.—A fair volume of business is reported by plumbers' supply houses, but the demand for Manufactured Lead still keeps below the normal for this time of the year. List prices are firmly maintained.

Spelter.—The price of Ore has advanced lately, and the market for Spelter has stiffened. Consumption does not, however, show much increase, and jobbers' prices for small quantities remain at the former quotation of 4¼¢. ℔ lb for Western.

Sheet Zinc.—The market is strong at 5½¢ ℔ lb for 600 lb Casks, and 6¢ for single Sheets. Consumption does not expand to any large extent, nevertheless stocks are sufficiently narrow to insure steadiness at the advanced prices, even if a further rise does not take place. In another column will be found the revised Sheet Zinc discount sheet and list of extras issued by the manufacturers.

Antimony.—Except in a jobbing way the movement is very slow, but supplies are well taken up and prices for small quantities remain quite steady at 10¾¢ for Cookson's, and 10¢ for Hallett's.

Tin Plates.—The market for Tin Plates has not improved materially. While orders for future delivery show a slight increase, the movement is still slow for the season. Can makers appear to be postponing to the last moment the filling of their requirements, on the chance of obtaining their material under the lower duty rate. Canners' prospects for this season are referred to as very good so faras agricultural products are concerned, and Tin Plate dealers are in expectation of some good business in this quarter in the near future. Spot business is confined generally to the usual hand to mouth style of orders, but enough of these are passing to keep the trade fairly busy. That consumption throughout the country has increased during the past few weeks is sufficiently proved from the fact that shipments of Tin Plates from the other side in the month of May increased some 60 % over those for April, while it is stated that the amount of stocks in bond in this country showed little or no growth at the same time. Moreover, domestic manufacturers are busy and disposing of their product regularly. Prices are still low and somewhat weak, except for special sizes of which the stocks in bond are limited.

A special cable dispatch from London to *The Iron Age*, dated June 13, reports on the British Tin Plate market as follows: In the Tin Plate market there has been an improved business at somewhat better rates, chiefly three months' futures at full rates. Makers hesitate to book orders for far forward delivery in the face of stiff bids made by buyers for distant future shipments. Bessemer Cokes have advanced about 1½ pence during the week, and larger demand has raised the price of Ternes to 19/ for double box. Black Plate for prompt delivery is at a premium. Stocks at Swansea are 288,000 boxes.

Sheet Iron.—Galvanized Sheets for immediate delivery are scarce and prices are firmer. The same may be said of Black Sheets, especially those of lighter gauges suitable for tinning. The scarcity of fuel having caused the closing down of a number of mills, those which continue in operation are crowded with orders and are unable to quote prices for early delivery. The consumptive demand for ordinary Black Sheets in this district is not excessive, but those adapted for tinning are in very active demand and command good prices. Makers are not yet able to meet the increased demand for this material, but Tin mills are being widely added to existing works, and the productive capacity will within a short time be very largely increased.

Chicago Report.

Scrap.—Dealers continue to quote the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Trade keeps up well, notwithstanding the advance. The scarcity of Soft Coal is severely felt, diverting many consumers to the use of anthracite. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch
Chicago, Ill	$5.25	$5 50
Milwaukee, Wis	5.25	5.50
Kansas City, Mo	8.45	8.70
Council Bluffs, Iowa	8.45	8.70
Lincoln, Neb	8.60	8.85
Sioux City, Iowa	8.45	8.70
Aberdeen, S. Dak	8.50	8.75
Dubuque, Iowa	6.55	6.80
Madison, Wis	6.75	7.00
St. Paul, Minn	7.75	8.00
Burlington, Iowa	6.75	7 00
Des Moines, Iowa	8.20	8.45
Davenport, Iowa	6.55	6.80
St. Joseph, Mo	8.45	8.70
Leavenworth, Kan	8.45	8.70
Omaha, Neb	8.45	8.70

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

The American built steamer "El Rio" made the trip from New York to New Orleans last week in 4 days, 17 hours and 28 minutes, breaking all previous records by over two hours.

CONDITION OF THE

Hardware Trade.

THE USUAL FALLING OFF in the volume of business which is noticeable in the middle of June is this year increased somewhat by the prevailing quietness in trade, and as a result merchants and manufacturers refer to business as dull. A good many travelers are home, but there is still a good force on the road. Orders for the most part are carefully assorted and considerably smaller than usual, the trade being careful to restrict their purchases to their actual requirements. There is little new in the matter of prices, and on the general line of Shelf Hardware the market is low and somewhat uneven. Manufacturers, especially in heavy goods, are carefully booking orders for future delivery, realizing that there may a change in existing conditions. The trade are looking forward to a quiet business during the next month or two, but hoping that if tariff questions are settled and financial matters are not disturbed there will be a good trade in the fall.

The following letter from Farwell, Ozmun, Kirk & Co., St. Paul, was intended for use in our last issue, but was received after we had gone to press:

Business is showing the usual impulse of the season to some extent and our jobbers have an increased number of orders, but there is not sufficient increase to bring the volume of trade up to that of May, 1893, and this is true notwithstanding the fact that during May of last year the effects of the panic had begun generally to affect business. The trade is also running along more uniformly than was true earlier in the season, and it is now free from any spasmodic features.

The difference is now but little in the sales of corresponding months of the two years, and by July it is reasonably to be expected that the balance on sales per month will be considerably in favor of the present year. This will certainly be true if the crops come on anywhere nearly as favorable as they now promise.

On the whole the jobbing interests of the Northwest are doing fully as well as expected in amount of trade, and this is to be measured with the fact in view that credits are now more carefully scrutinized than ever before. With anything like fair crops jobbers expect very light losses through bad debts.

Prices have advanced on Nails, and the market is firm at present. As to what will be the more lasting effect of the coal strike on the price of Nails and other staples, it is a matter of speculation, but it is certain that for some time to come the price will be affected to some extent. Prices on Barbed Wire and Tin Plate are firm.

The market here is following the advance on Rope. Collections are up to expectations and are fair for the season.

Advices from Chicago.—The movement in Shelf Hardware continues about the same as reported last week. The present week has opened up fairly well with a good number of orders coming in from traveling salesmen and also in ordinary mail. The month is expected to show up about the same as May, notwithstanding the increased sales during a part of that month on account of the freight flurry. No special change has occurred in prices of either Shelf or staple goods. The Heavy Hardware trade is fair and moves along steadily from week to week at about the same volume. Jobbers are now receiving the benefit of the

failure to make future contracts last spring by the Wagon and Carriage manufacturers. They are coming into the market regularly for their purchases of material, thus contributing their share of swelling the current volume of business. Collections are good and payments are being more promptly made than usual within the regular times fixed for credits.

Notes on Prices.

Wire Nails.—The Wire Nail market continues firm, with a fair though not heavy amount of business. Quotations are well maintained on the basis of $1.10 to $1.15 for carload lots, f.o.b. mill. Small lots from store in New York are held at $1.25 to $1 30.

Advices from Chicago.—Manufacturers are receiving some inquiries, but they are by no means numerous or large. A quiet appears to have set in, which may continue for some time. More factories have shut down for lack of fuel, and a general closing is expected to take place in July as usual. Prices are very firm, on account of the diminished production and increased cost of raw material, as well as advances in freight rates. Quotations now range from $1.20 to $1.25, Chicago, for factory lots. Jobbers quote $1.25 for small lots from stock, and report a fair trade, but no call for carload lots.

Cut Nails.—There has been comparatively little change in the Cut Nail market for several weeks, this line not advancing in sympathy with Wire Nails as much as the manufacturers would desire. There is active competition among the mills for such business as is going, and some Western companies are looking aggressively after business in the East, which has the effect of keeping prices lower than they would otherwise be in the territory of the Eastern mills. The demand is fair and the aggregate of orders considerable, although the trade are not buying very freely nor in excess of their actual wants. Sales have been made of Western Nails during the past fortnight at figures which, taking into consideration the present cost of production, are lower than have previously been made. Eastern mills are quoting 95 cents to $1 for Nails delivered on dock in New York. The store price for small lots in New York is $1.10 to $1.15.

Advices from Chicago.—The market looks a little firmer. Sales are being made for immediate shipment and manufacturers are not attempting to make contracts for future delivery. Concessions are now refused, and extreme rates current a short time since have been completely withdrawn. Prices quoted by Wheeling manufacturers are higher, but local rates continue at 90 to 95 cents on 55-cent average, with a very fair volume of business reported for the week. Jobbers are having only a light trade in Cut Nails, but continue quotations for small lots from stock at $1.10 to $1.15.

Barb Wire.—The Barb Wire market is quiet and without new features of importance. The following quotations for Four-Point Galvanized Wire, delivered at the points named, represent the market: Pittsburgh, $2.10 to $2.15; Cleveland, $2.15 to $2.20; Cincinnati or Allentown, $2.20 to $2 25; Chicago or New York, $2.25 to $2.30.

Advices from Chicago.—Manufacturers of standard Wire have advanced their quotations 5 cents per hundred on account of advancing freight rates and higher cost of raw material. The local makers are still behind in their shipments, but new business shows a marked falling off and is expected to be quiet for some time. Mills generally will be closed for repairs during July. Prices are therefore expected to be maintained at rates now fixed. Plain Wire shows a steadily advancing tendency. Jobbers are having a light trade from stock. Quotations are continued on Galvanized Barb Wire at $2.35 to $2.40 for small lots and $2.20 to $2.25 for carload lots.

Cordage.—The demand is very fair and business is quite active considering the season. The recent advance of ¼ cent per pound in Manila, Sisal and New Zealand has been maintained and the market is characterized by a strong tone. Quotations for large lots, f.o.b. factory or New York, are as follows, subject only to a discount of 1½ per cent. for cash.

	Cents.
Manila, base	7
Sisal, "	5
New Zealand, base	5

Sheet Zinc.—Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue a revised discount sheet under date of May 28. The base price, $4.50 per 100 pounds, continues unchanged, but revised discounts are announced as follows:

Discounts.	First class. 15 600-pound casks and upward.	Second class. 10 to 14 600-pound casks.	Third class. 5 to 9 600-pound casks.	Fourth class. Under 5 600-pound casks.
	Per cent.	Per cent.	Per cent.	Per cent.
Special	7	7	7	7
Cash with order	3	3	3	3
Quantity	3	2	1	0
Totals	13	12	11	10

Under date of May 30 they issue another circular in which changes in the extras, in cents per 100 pounds, are announced as follows, the discounts mentioned above remaining unchanged:

Nos.	5	6	7	8	9	10	11	12	13	14	15
32 to 40 x 84	70	40	25	05	.....	.....	.....	.....	.....	.....	.....
32 to 46 84 x to 90	....	....	....	....	none	none	none	none	none	none	none
52 x 84	....	....	210	90	75	60	40	40	40	40	45
50 x 84	....	....	140	70	50	30	20	20	20	25	25
48 x 108	....	....	110	80	65	45	20	20	20	25	25
48 x 96	....	....	90	40	35	15	15	15	15	15	15
48 x 84	230	125	75	25	20	05	05	05	05	05	05
36 x 108	150	130	70	35	30	20	20	20	20	20	20
36 x 96	125	60	35	20	15	05	05	05	05	10	10
30 x 84	100	65	45	25	15	15	15	15	15	15	15
28 x 84	110	75	55	30	20	20	20	20	20	20	20
26 x 84	130	85	65	40	30	25	25	25	25	25	25
24 x 84	140	100	80	20	15	05	05	05	05	05	05

The extra on No. 4 36 x 84 is $1.25 per 100 pounds.

Double Tank Thermometer Churn.—R. M. Ball, Muncie, Ind., is manufacturing this article, which was described in *The Metal Worker* June 9. The Churn is sold to the trade at $42 per dozen, net, f.o.b. Muncie.

Scrapers.—The Scraper which is being introduced by Harris E. Thomas, Lansing, Mich., an illustration of which was given in our last issue, is sold at $2 per dozen, or $20 per gross, net.

Telephones.—The Telephone outfit described in *The Metal Worker* June 7, and manufactured by Robert H. Ingersoll & Brother, 65 Cortlandt street, New York, is sold at $7.50, subject to a discount of 33⅓ per cent.

Glass.—Local Glass trade is reported as being light, while from Glass centers we learn that Glass is in fair demand. Prices continue firm, and manufacturers as a rule are not making concessions to induce trade. Factory quotations in car lots are reported from Pittsburgh as follows: Single strength, 80 and 10 and 5 per cent. discount; double strength Glass, 80 and 20 per cent. discount. French window Glass is reported firm at 80 and 10 per cent. discount for single or double strength, in any quantities. Plate Glass is in fair demand, the imported article being quoted at 70 and 10 per cent. discount.

Old Metals.—The demand for Old Metals moves slowly and prices continue on their former low level. The following quotations represent about the prices paid by New York dealers:

Heavy Copper	℔ lb	6¾¢
Light and Tinned Copper	℔ lb	6 ¢
Heavy Brass	℔ lb	4½¢
Light Brass	℔ lb	3¾¢
Lead	℔ lb	2½¢
Tea Lead	℔ lb	2¼¢
Zinc	℔ lb	2 ¢
No. 1 Pewter	℔ lb	12 ¢
No. 2 Pewter	℔ lb	6 ¢
Wrought Scrap Iron	℔ gross ton	$8.00
Heavy Cast Scrap	℔ gross ton	7.00
Stove Plate Scrap	℔ gross ton	3.50
Burnt Iron	℔ gross ton	2.50

Old Rags, Paper, &c.—The market for these materials continues very quiet and prices rule low. The following are the current rates paid in New York for Old Rags, Paper, &c.:

No. 1 White Rags	℔ lb	3¼ @ 3½¢
No. 2 White Rags	℔ lb	2 @ 2¼¢
Mixed Rags	℔ lb	¾¢
Blues and 3ds	℔ lb	1 @ 1¼¢
Hard Sized White Shavings	℔ lb	2½ @ 2¾¢
No. 1 White Book Shavings	℔ lb	1¾ @ 2⅛¢
No. 2 White Book Shavings	℔ lb	1⅛ @ 1½¢
Light Book Shavings	℔ lb	¾¢
No. 1 Mixed Shavings	℔ lb	1 @ 1¼¢
No. 2 Mixed Shavings	℔ lb	¾ @ 1 ¢
No. 1 Printed Books	℔ lb	1 @ 1¼¢
Ordinary Mixed Books	℔ lb	½ @ ¾¢
Newspapers	℔ lb	2-5¢
No. 1 Manila Paper	℔ lb	¾ @ 1 ¢
No. 2 Manila Paper	℔ lb	⅝ @ ¾¢
Bogus Paper	℔ lb	½¢
Common Paper	℔ lb	⅝¢
Straw Chips	℔ lb	½¢
Binders' Clippings	℔ lb	½¢
Jute Butts	℔ lb	1½ @ 2 ¢
No. 1 Jute Bagging	℔ lb	1 @ 1¼¢
Mixed Bagging	℔ lb	¾ @ 1 ¢
No. 2 Bagging	℔ lb	½ @ ¾¢
Hemp Twine	℔ lb	2 @ 2¼¢

Manila Rope	℔	lb 2⅛ @	2¼¢
Jute Rope	℔	lb 1⅛ @	1⅜¢
Mixed Rope	℔	lb ⅝ @	⅞¢

Old Rubber.—The following are about the prices for Old Rubber, delivered in New York, except where otherwise stated:

Car Springs, ton lots, ℔ lb.	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.03½
Rubber shoes, less than carloads, ℔ lb.	@	.03¼
Large Hose, ℔ ton	@	12.00
White Wringer Rolls, ℔ lb.	@	.03¾
White Syringes, ℔ lb	@	.03¾

Trade Notes.

WE ARE INDEBTED to William J. H. Gluck, Baltimore, Md., for a batch of interesting advertising matter relating to the very extensive line of goods that he handles. Two of the larger catalogues relate to leading Stoves, both coal and gasoline; the separate slips call attention to Refrigerators, Ovens, Gauze Door Ranges, Oil Stoves, Sieves and Strainers, Steam Cookers, &c. The separate pamphlets are illustrated catalogues and price-lists of Refrigerators of different sorts and Ice Cream Freezers. The prettiest of the circulars relates to Iron Clad Ware handled by Mr. Gluck.

THE ROME MFG. COMPANY, Rome, N. Y., manufacturers of Rome Seamless Copper Tea Kettles, Tea and Coffee Pots, have opened an office at 92 Walker street, New York City, where they will be represented by A. A. Butler, who will carry a full line of their goods to supply the New York City and Eastern trade.

THIS WEEK'S ADVERTISEMENT of the Excelsior Steel Furnace Company, 38 West Monroe street, Chicago, gives a complete price-list of Register Boxes for first and second floors, outside and inside. The company manufacture and keep in stock all kinds and sizes of such Boxes.

THE TRADE will regret to receive the announcement sent out by the Townley Metal Company, Kansas City, Mo., under date of June 6, of the death of W. F. Beckwith, which occurred on June 5 at Pittsburgh, Kan. Mr. Beckwith was on one of his regular business trips when he was taken ill with malarial fever, which, in spite of every care and attention, terminated fatally.

UNDER DATE of May 15 the Rome Mfg. Company, Rome, N. Y., issue a revised price-list of nickel plated and polished copper Tea Kettles, nickel plated and polished copper Range Kettles, nickel plated copper Tea and Coffee Pots.

THE PLANT of the W. F. Washburn Brass & Iron Works, Yonkers, N. Y., was sold under the direction of the receiver, Joseph M. Stoughton, at public auction, June 6, by E. De Forest Shelton & Co., 280 Broadway, New York City. The machinery was sold in many lots, to buyers from Pennsylvania to New Hampshire, thus removing the possibility of the plant being again started at Yonkers.

MERCHANT & COMPANY, INCORPORATED, Philadelphia, send out a pretty pamphlet printed in colors, relating to Merchant's Metal Tiles, Star Ventilator and Continuous Roofing Tin. The title of the little circular is "Metal Specialties for 1894."

C. MACKINTOSH, 61 Beekman street, New York, has been appointed sales agent in New York, Pennsylvania east of Harrisburg and the Northeastern States for the New Philadelphia Iron & Steel Company of New Philadelphia, Ohio, makers of Black and Galvanized Sheet Iron and Sheet Steel.

Apparatus for Electric Welding.

Letters patent for an apparatus for electric welding embodying several new and novel features have been issued to Rudolph M. Hunter, and been assigned to the Johnson Company of Johnstown, Pa. The particular construction employed as an example of the use of the apparatus is that in which it is used for the manufacture of steel rails wherein the feet or chairs are welded to the webs of the girder rail so as to give it additional hight and a self supporting base. This rail construction is well known and has been manufactured by other methods of welding the two parts together. In the processes heretofore used for electrically welding the feet to the web of a girder rail, there was employed apparatus in which the two parts were firmly gripped in suitable jaws, the parts pressed together, and an alternating current of great volume caused to pass through the parts in contact so as to cause the metal to fuse and weld together.

In carrying out the present invention the two parts of the metal to be welded are brought in firm contact and submerged in a liquid, preferably acidulated water. While so immersed a continuous electric current from an electrode in contact with the liquid is passed through the metal parts to be united and back to the source of electrical energy, the liquid being employed as a conductor for the current. In practice the positive current is delivered to the electrode submerged in the liquid and the negative current is delivered to the parts of the metal to be welded. The action of the current causes the decomposition of the liquid, generating gases adjacent to the metal parts in contact to be welded, and this produces such reactions that the portions of the metal in contact with the liquid are instantly brought to a welding heat. In this method of welding a considerably more intense current or one of greater tension is required than in the alternating system before referred to, and the current is preferably continuous in its nature or what is known as a continuous current as distinguished from an alternating current. It might be a pulsating or intermittent current if desired. When the two parts of the metal in contact are fused or brought to a welding heat they instantly unite, forming an integral structure; and this joint may be further strengthened by having the parts which are welded subjected to pressure performed by hydraulic, gravity or steam devices.

In this particular device a traveling support or carriage is provided for the girder rail and suitable clamps carried by the carriage for the feet, whereby the latter may be adjusted in position with respect to the rail while it is held on the carriage. At one place adjacent to the rails or bed upon which the carriage moves the joint between the foot portions and the girder rail is surrounded by a suitable hollow frame through which a liquid is caused to flow to submerge the parts in contact during the electric welding operation. After the welding has been performed the liquid is lowered, the hollow frame is separated, and the rail with its welded foot is moved along to be brought under a hammer or compression device. Simultaneously with the foregoing operation a second foot, previously clamped in position upon the rail, is brought into position so as to be held in the hollow frame and subjected in its turn to the welding operation. By this means the welding and forging or compression operations may be carried on simultaneously but successively with respect to a single part operated on.

News and Notes.

The receivers of the Union Pacific Railroad have concluded to relieve the company of the burden of carrying numerous small branch lines which have no prospect of paying operating expenses. An application has been made to the court asking permission to drop a number of branch roads aggregating about 1100 miles.

The offer of a prize of $50,000 for the invention of the best underground electric propulsion system, to be determined by the State Railroad Commissioners, has been withdrawn by the Metropolitan Traction Company of New York City.

A striking illustration of the value of goods depending on their proximity to market is shown by the railroads in Mexico using mahogany for ties, this valuable wood being there so abundant and difficult of carriage to markets where it is called for.

The waters of the disastrous flood in the Frazer River Valley, B. C., are subsiding, leaving behind them ruined crops, devastated farms, drowned cattle, and even loss of human life. The amount of damage done by the flood is estimated at several million dollars.

A joint conference between the leaders of the Knights of Labor, American Federation of Labor and other labor organizations began in St. Louis on Monday. Its object is to arrive, if possible, at an agreement for harmonious and concerted action in the questions now under agitation.

Three Chinese naval officers attached to the Chinese Legation at Washington are visiting the shipbuilding establishments of the United States, with a view of studying methods of construction for the benefit of their country. They have been making a close inspection of the Philadelphia yards this week.

The Cramps have been ordered to proceed with the work of repairing the damage done to the hull of the cruiser "Columbia" at her recent trial. The work will be done at the League Island Navy Yard, Philadelphia, and will occupy about a month.

The rolling mill operatives at the northern end of the Tuscarawas Valley, Ohio, have not displayed that careful exercise of judgment during the coal miners' strike that has characterized their actions in the past when disturbances of this kind occurred. While trouble may be fast approaching for themselves they enter freely into those of others. At Canal Dover, Ohio, the rolling mill men of that place and New Philadelphia were ringleaders in an attempt to prevent the militia from going to Cambridge, and on Saturday last formed a parade and marched to Pike Run, south of New Philadelphia, to take part in a mass meeting of miners. The members of the Amalgamated lodges walked 6 miles and back under a scorching sun, but the miners concluded to stay at home and did not avail themselves of the kindly offices of the iron workers, whose action caused much surprise and adverse comment.

Metal and Miscellaneous Prices.

CHICAGO, JUNE 14, 1894.

Tin—

Straits pigs.....21¼¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	@$5.60
IC, 14x20, 90 lb	@ 5.35
IC, 14x20, 100 lb	5.50 @ 6.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
S.V. Grade. IC, 10x14, 14x20	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $6.50
20 x 28	@ 11.00
IX. 20 x 28	@ 14.00
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.60
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.60
	Per box of 56 sheets.	
X, 14 x 56	29.50	16.60
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.66
XX, 14 x 60	35.50	20.00

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.76
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20..$9.25
Royal, extra, IC, 14 x 20.... 7.26
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
IC, 20 x 28.....12.50

Roofing Plates.

Palm, IC, 20 x 28.....@$11.60
Palm, IX, 20 x 28.....@ 14.00
Kenmoire, IC, 20 x 28.....@12.00
Empire, IX, 20 x 28.....@16.00
Hickory, IC, 20 x 28.....@ 12.50
" IX, 20 x 28.....@ 15.60
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.76
Special, IC, 20 x 28.....@ 14.75
" IX, 20 x 28.....@ 17.25

Westmoreland:
IC, 14 x 20..... $6.00
IC, 20 x 28..... 12.00

Elwood:
IC, 20 x 28 ..... $11 50

Kenwood:
IC, 20 x 28.....$11.50

Furniston:
IC, 20 x 28..... ...$11.00

Juno:
IC, 14 x 20..... $6.75
IC, 20 x 28..... 11.50

Illinois, Old Method:
IC, 20 x 28.....$17.00

E. L.:
IC, 20 x 28.....$12.50

Jessie:
IC, 20 x 28.....$12.00

Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20..... ....$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 .....11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28.....19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28.....22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20..... 7.60
" " IC, 20 x 28.....12.50
" " IX, 20 x 28.....16.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared).....$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared).....19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared).....16.50
Columbia, IC, 14 x 20 (Stamped).... 7.25
" IC, 20 x 28 (Stamped)....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28.....13.00
Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28.....12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 ..... 12.00
Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
" (Redipped), IC, 20 x 28 .....17.00

Old Process:
IC, 14 x 20..... 9.25
IX, 14 x 20.....11.25
IC, 20 x 28.....18.60
IX, 20 x 28.....22.60

H. B. L., Old Style:
IC, 14 x 20..... 7.75
IX, 14 x 20..... 9 25
IC, 20 x 28.....15.60
IX, 20 x 28.....18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 3-10¢	3 1-10¢
17 to 20	₩ lb 2 4-10¢	3 2-10¢
21 to 24	₩ lb 2 6-10¢	3 3-10¢
25 and 26	₩ lb 2 6-10¢	3 4-10¢
27	₩ lb 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ lb A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis.75@5%

Copper—

Ingot.

Lake.....10¼¢ @ 10⅝¢
Casting Brands.....9¾¢ @ 10⅛¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.34
Plain, ½ inch up to ⅝ inch	.33
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.33
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 lb lots.)

Discount, 40%.

Slab Spelter—

Western Spelter..... .....4¢

Sheet Zinc—

600 lb casks.....4.50¢
800 lb casks.....4.70¢
Loose sheets.....4.80¢

Lead—

Soft Pig Lead.....4 ¢
Bar.....4½¢
Pipe.....6½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12½¢
Hallett's.....11½¢

Wrought-Iron Pipe—

1¼ and under, Plain	67½%
1¼ and under, Galv.	50%
1½ and over, Plain	67½%
1½ and over, Galv.	57½%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	62½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	65¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.50 square
Climax.....$3.35 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.50 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ lb, 2 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, B. Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 5½¢
" Ground in oil, Brown	₩ lb, 5½¢
" Ground in oil, Purple	₩ lb. 6 ¢
Linseed Oil, Boiled, in nobls	54¢@56¢
Linseed Oil, Raw, in bbls	51¢@53¢
Mineral Paints	2@4¢
Orange Mineral	9½¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, kegs	8½¢; 7½¢
Sipe's Japan Oil, in bbls. ₩ gal	84¢
Spirits Turpentine, in bbls., ₩ gal	36¢ @36½¢
Asphaltum, Trinidad Refined, ₩ ton	
Tarred Felt, 1 Ply, ₩ 100 lb	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.75
Roofing Pitch, lb bbl. of 300 lb	$3.00

NEW YORK, JUNE 15, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:

Small lots	₩ lb, 66¢
100-lb lots	₩ lb, 63¢
Ton lots	₩ lb, 60¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots	₩ lb, 63¢
100-lb lots	₩ lb, 60¢
Ton lots	₩ lb, 56¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	₩ lb, 60¢
100-lb lots	₩ lb, 56¢
Ton lots	₩ lb, 50¢

Antimony—

Cookson	₩ lb, 10½¢
Hallett's	₩ lb, 10 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List April 9, 1894.

Plain Round Tube.	Per ft.
¾ in. up to 2-in	$0.35
5/8-in. up to ¾-in	.30
½-in. up to 5/8-in	.38
3/8-in. up to ½-in	.41
5-16-in. up to 3/8 in	.48
¼-in. up to 5-16-in	.65
3-16-in. up to ¼-in	1.00
⅛-in. up to 3-16-in	1.50
Smaller than ⅛-in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 15, inclusive	.38

25 @ 30%

Cooper and Bronze Tubing—
3¢ ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square*—
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ₩ lb, net
Ingot.

Lake	10¼¢
Ansonia Grade Arizona	10 ¢
Ausonia Grade Casting	9¼¢
Planished	net
Sheet and Bolt	15¢ ₩ lb, net, basis

Tubes — See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne. ..60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.					
4½	6	5½	6	7 inch,	
$0.78	.87	.90	.99	1.20	per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2.50	2.80¢
Nos. 17 to 21	₩ lb. 2.60	2.90¢
Nos. 22 to 24	₩ lb, 2.70	3.00¢
Nos. 25 and 26	₩ lb. 2.80	3.10¢
No. 27	₩ lb, 2.90	3.20¢
No. 28	₩ lb, 3.00	3.30¢
American B. B.	₩ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11¾@12½¢
Patent Planished....₩ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....₩ lb 8¾¢

Galvanized.

	B. B.
Nos. 10 to 16	75@75&5%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....3¾¢@3¾¢
Bar.....4½¢
Pipe.....6¾¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6¾¢, 20%
Old Lead in exchange, 2½¢ ₩ lb.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil: Raw, ₩ gal	@ .50
Boiled	@ .53
Spirits Turpentine: In bbls	@ .30½
Putty: In barrels and ½ bbls	.01¾ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01¾ @ .02¼
In bladders	.01¾ @ .02¼
Roofing Material, &c.: Asphaltum, Trinidad Refined, ₩ ton	$30.00@$35.00
Asphaltum, Rock, ₩ ton	$14.00
Coal Tar Felt, 1 Ply, ₩ lb	2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft.	$1.85
Roofing Pitch, ₩ bbl	$2.25

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, June 23, 1894.

DAVID WILLIAMS, - PUBLISHER

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CINCINNATI.....Rooms 23-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Self Reliance.

No man was ever truly great who was not self reliant. The very exercise of this virtue sets the man apart from his fellows in the walks of life, makes of him a thinking being who decides for himself and acts for himself. His deeds bespeak his inner thoughts; they do not merely reflect the ideas of others. No matter how far down in the scale we go, still we find the man who relies first upon himself, creates for himself a distinct individuality, is the man who gradually climbs above his fellows and his surroundings. Daily and hourly the mechanic is called upon to display that ability of his order that should enable him to do his work rapidly and well without the help of others. Not that such an individual should become egotistical, but that he should so consider and apply that which he has read and heard that at the moment of application he need not run to others for suggestions. It is a matter of thinking and deciding for himself, and each time he does it his future ability is increased, his self reliance strengthened. Every foreman or superintendent soon reads the character of his men. Some in the spirit of sincere interest will ask deep and searching questions as to why and wherefore; others are soon marked by their habit of continued questioning apparently because it is easier to ask than to think. To this latter class there will, as a consequence, be given little of the work requiring forethought and judgment; in fact, the very opportunity of exercising such self reliance as they may possess will be removed, while the men to whom such tasks are given will be continually educated and elevated.

Cultivating Self Reliance.

While heredity may have somewhat to do with a man's abilityto think and act for himself, nevertheless no man can be excused, for it is a virtue that can be trained. The good work must begin at home; the man must first learn to control himself before he can expect to exercise his ability over or among others. It is related of "Stonewall" Jackson that his wonderful success was due to his continued exercise of self control and self denial, and that thus "he had conquered himself and was thus made fit to be a conqueror." So the mechanic who first determines to conquer himself, who resolves never to ask a question until he has first endeavored to answer it himself, who willingly hears the opinions of others, but carefully forms his own, will gradually but certainly change his character and make his actions more and more independent of those of others. The self reliant mechanic can never be merely imitative; he must, in the broad sense, be creative, inventive. Even if he has a thousand times seen a thing done in a certain way it is no reason why he should not seek a better if that already known is not satisfactory. To almost every mechanic comes constantly the necessity of determining some way of accomplishing a result which he has never seen before. It is so easy to fall into an abstract way of thinking of such matters, feeling that like a sermon they apply to some one else, that the ordinary man fails to profit by their consideration. Let him rather test the advice in his next day's work. Let him determine that what he does shall be done by right of his ability to accomplish it; that he will command confidence by his self reliance; that he will seek rather than avoid opportunities to assume responsibility. The change will not come in a day, but come it will, and as the months and years roll by he will find himself, and, better still, others will discover him, to be a thinking, a self denying, a self controlling, a self reliant man.

Features of the Coal Strike.

The coal miners' strike is ending in about the usual way. Some districts have been able to secure the advance for which they contended, others got no advance and some figure out an actual reduction. The national leaders have lost their prestige and in those districts in which no substantial advantage has been gained it would hardly be safe for them to put in an appearance. For nearly two months the miners and their families have endured pitiful privations and now find themselves too often burdened with an indebtedness which will require months of the most pinching economy to discharge. Meanwhile their reflections must be bitter against the foolish leaders who ordered the unions under their control to strike. But particularly bitter must the reflections be of those miners who had no personal grievances and merely struck through sympathy, in the belief that a general suspension of coal mining would end the strike very quickly. They were greatly deceived in their estimate of the stocks of coal above ground and the supply available from mines not yet under control of the unions. Coal consumers themselves have doubtless been surprised to find that so long a strike could be experienced without much more serious results occurring from the scarcity of fuel.

Lesson of the Strike.

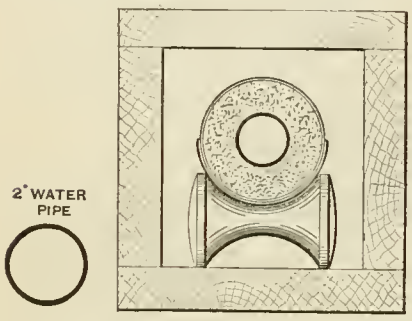
A lesson of this strike, therefore, and one which should be taken to heart at this time by other workingmen in danger of being beguiled by seductive agitators, is the very long time needed to make the strike felt by any considerable proportion of the public. A stoppage of the mines for a week or two was expected to check all business and create a formidable sentiment in favor of the quickest means to settle the strike. Such a short suspension of work was a holiday, and the miners threw down their picks with alarcity. Had they known that nearly two months would be permitted to pass without a general wail of distress from consumers, it may be doubted whether they would so cheerfully have courted the uncertainties of a strike. No matter how necessary their product may be, the workingmen in any line will find a period of business depression a poor time for entering upon a strike with any expectation of gaining substantial benefit.

The City Council of Philadelphia have just passed an excellent ordinance in relation to the removal of kitchen and other garbage. It directs that housekeepers shall use only metal receptacles, water tight and covered, for the garbage, which will be removed by the contractors in metal, water tight and covered carts. Heretofore the practice of householders there, as in New York and Brooklyn, was to place all kinds of open vessels and receptacles full of garbage on the sidewalks to await removal, regardless of their being offensive to sight and smell, and that the wind frequently blew the lighter kind of refuse into the neighboring properties, conveying, perhaps, some disease with it. The order provides that householders or contractors failing to observe the new regulations will be subject to arrest and a fine. This sensible proceeding might be followed with advantage by the municipal authorities in other cities where the unsanitary practice of leaving uncovered refuse pails on the sidewalks for hours still prevails.

THE LETTER BOX.

Long Line Piping for Steam Pump.

From FOUNDRYMAN, *Tennessee.*—We wish to run a steam pipe from our boiler to a pump located near a creek, to force water into a tank on top of a tower 50 feet high. The boiler is 700 feet from the pump and the steam pipe is to be run under ground. The pump is located on the side of a hill. It is 50 feet from the top of hill to creek and the pump is 20 feet from top of hill, but is sunk into a pit, leaving it about 15 feet above water level. From boiler to top of hill (680 feet) the steam pipe will run on about a level. The boiler is 40 horse-power and is run at 60 to 80 pounds pressure. The pump is a Deane pressure pump. The diameter of steam cylinder is 7 inches; dismeter of water cylinder, 4¼ inches; stroke, 8 inches, and capacity 120 strokes per minute or 58 gallons per minute. Size of steam pipe, 1 inch; size of steam exhaust pipe, 1½ inches; size of suction, 3 inches; size of discharge, 2 inches. What we wish to know is whether a steam pipe can be run from the boiler to the pump so that it will work successfully; what size steam pipe it will require; how should steam pipe be protected under ground from freezing, &c.; how should the pipe be drained, and what provision should be made for expansion and contraction?



Long Line Piping for Steam Pump.—Fig. 1.—Section through Box and Steam and Water Pipes.

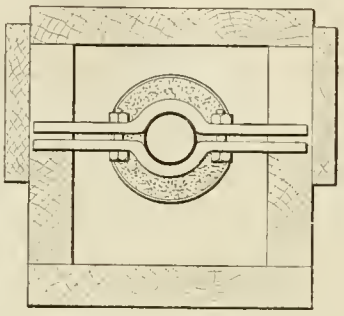


Fig. 2.—Section Showing Clamp.

Answer.—The question of size of pipe for the duty and friction of pumping for water and the friction and condensation of steam require some consideration. With a 2-inch discharge pipe carrying 50 gallons per minute, the friction head for 700 feet of pipe with the necessary elbows will be 20 pounds per square inch or 46 feet in addition to the total hight from the creek to the tank, which, as we interpret the meaning of our correspondent, may make a total of 146 feet head to be pumped against. This is equal to 63 pounds per square inch pressure on the pump piston. As the steam cylinder is two and three-quarter times the area of the water cylinder, then $\frac{63}{2.75} = 23$ pounds, the actual steam pressure required upon the steam piston per square inch to balance the pump pressure. To this should be added 50 per cent. for pump friction under the required speed, say 35 pounds pressure at the pump.

The steam cylinder at 100 strokes per minute will require 18 cubic feet of steam per minute at 35 pounds pressure, or 10½ cubic feet at 60 pounds pressure, the lowest normal pressure at the boiler. This would involve a loss of 35 pounds pressure by friction and condensation if 1-inch pipe is used, so that the next size larger, or 1¼ inch, is the smallest that should be used, which will involve a friction loss of 21 pounds, making the pressure at the pump 39 pounds or sufficient for its work.

The expansion of the steam pipe should be provided for for a length of 650 feet, say from the point of entering the ground to the brow of the hill. For this purpose a hard brass slip joint made for a run of 14 inches should be inserted as near the middle of the line as convenient in a bricked up chamber with cover large enough for convenience in packing the joint. A strong clamp and anchorage at each end of the straight pipe line will divide the expansion so that the travel at the expansion joint will be as short as possible on either line, and which is found to be more satisfactory than to have the expansion move all in one way, in which case the slip joint could be placed in the boiler room. For the protection of the pipe not less than 1-inch felting of hair, or, better, magnesia felting, should be put on the pipe throughout its whole length from boiler to pump. At places from 12 to 15 feet apart a piece of galvanized sheet iron should be wired on the under side of the felting long enough to ride on a light cast iron spool, with the neck curved to fit the outside of the felting and sheet iron so that the spool will keep in its proper traversing position.

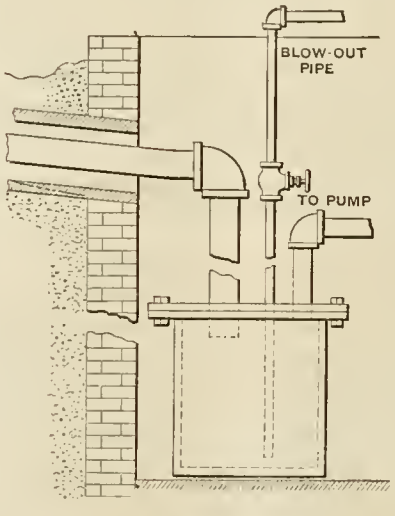


Fig. 3.—Separator Connection.

Outside of all should be made a box of pine, or, better, oak, wide and high enough to clear the felting by 1 inch all around, as shown in the cut, Fig. 1. The clamps, Fig. 2, should be made of ⅝ x 2 inch iron, 8½ inches long, let into the box between two sections, and a strip nailed over the slot to close the opening. One foot earth covering is sufficient for the climate where our correspondent is located. The steam pipe at the pump pit should drop into a cast iron separator of about 1 cubic foot capacity, which may be made of any convenient pattern, as a pot, with bolted cover, strong enough for the highest steam pressure in the boiler; with the pipe connections as illustrated in Fig. 3, or a piece of 6 or 8 inch pipe, 2 to 3 feet long, with caps, set on end and connected with the steam pump and waste pipe, carrying out the principles illustrated in Fig. 3, may be used. An ordinary float steam trap, such as used in the steam heating trade, which is automatic in operation, may also be used for a separator, the pump pipe being tapped through the cover away from the inlet. One-inch pipe and valve is large enough for the pump steam connection. After a few trials our correspondent will learn how often to blow off the waste trap if the plain box is used. The water pipe need be laid no deeper than the bottom of the box and in the same trench, as in Fig. 1. The warmth of the box will protect it from freezing. An air chamber on both suction and force pipe is required, possibly furnished with the pump. A large fine meshed strainer and foot valve at the lower end of the suction pipe, well

protected from flood and ice, with good judgment in making all the pipe work tight and the examination of every piece of pipe for obstruction previous to putting in place, will, we think, make our correspondent's pumping plant a success from the start.

Wants a Better System.

From T. H H., *Harrisburg, Pa.*—I notice in *The Metal Worker* of May 12 the letter of "W. S. G." of Penbrook, Pa., condemning the system of heating and ventilating a church in course of erection there. Now I would like to say for his benefit and those who have been commenting upon the matter that his statements are not in any sense facts. The statements were made partly through ignorance of the intent of the plans and, I think, partly intentional. His diagram showing the location of the registers is only in part correct. He then goes on to say that I intend to drive the stagnant air out of the room through the stack, which is as cold as Greenland. He, of course, did not know that this was to be warmed by the smoke flue, which will undoubtedly cause upward currents. The next misstatement he makes is that I intend to get my fresh air from the cellar. If he had taken the pains to have read the carpenter's specifications he would find that the carpenter has been directed to put in cold air ducts at the proper time, as may be directed. He then says that if the furnace were put in according to the plan the result would be a warm ceiling and a cold floor, also great loss of heat through friction and radiation in the cellar. I have recommended that the pipes be wrapped with asbestos paper, thereby reducing the loss from radiation to a trifle. The next barrier to perfection in the system, he claims, is that the chimney is lower than the roof. Now the top of the chimney is 20 inches lower than the comb of the roof and stands 18 feet away, with no other obstruction near. Now if "W. S. G." will insist that a stack as high as that one, and located as it is, will have down currents he only displays his ignorance. I have had some experience with his plan of pouring hot air into a room in an undivided volume, and I have found that those sitting near that volume roasted, while those around the outside of the room froze. Therefore I claim that distributing the heating registers is superior to bringing in the hot air in one volume and forcing it to all parts of the room. Especially is this true when there are heavy air currents on the outside. "W. S. G." should learn all the facts in a case before coming before the public and roasting any one, as one of the correspondents puts it, who through ignorance recommends anything that will be detrimental to health and comfort.

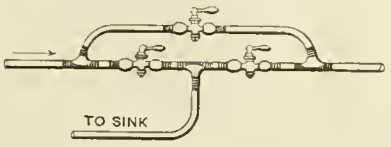
Wants Statistics on Brick Set Furnaces.

From CÆSAR, *Louisville.*—I noticed a short time ago, cannot say just where, a statement that brick set furnaces were passing out of date. Can *The Metal Worker* or its readers give about the difference in number that were put up ten years ago and in what proportion they are being placed at present? I would like to hear from some good brother of the craft why this decline, and why the portable is favored. There are several good reasons for it that can be proven to any practical furnaceman. This is a very important matter to the craft generally and a general discussion of it will prove beneficial.

What Is a By-Pass?

From E. O. H., *Melrose, Mass.*—I saw in *The Metal Worker*, May 5, the letter of "A. J. C.," asking "What is a by-pass?" The answer seems plain enough, but I cannot think of any possible circumstance where such an arrangement would be necessary, consequently I thought I did not understand the answer. I send two sketches of bypassaes, Fig. 1 showing the by-pass described in the answer, and I would ask why is Fig. 2 not a by-pass?

Answer.—A by-pasa is virtually another way to a given point, and it is possible that our description of its use has misled our correspondent. If a water meter or water motor was placed on the pipe at the point where the branch is taken off in Fig. 1, by opening the cock in the by-pass, water could pass beyond it and supply the main when



What is a By-Pass?—Fig. 1.—Showing a By-Pass.

the meter or motor was disconnected for any cause and the other cocks closed. In the use of valves on large street mains with a heavy pressure a bypass is frequently used in order to open them by letting water in the main beyond the valve to equalize the pressure on both sides of the valve gate. Otherwise a pressure of 60 pounds to the square inch on a 48-inch valve would find the gate withstanding a pressure of over 100,000 pounds and without the aid of a by pass to equalize the pressure the opening of the valve would be a difficult matter. From this description

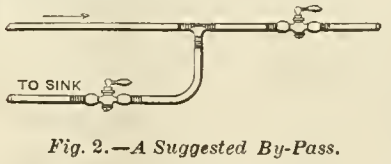
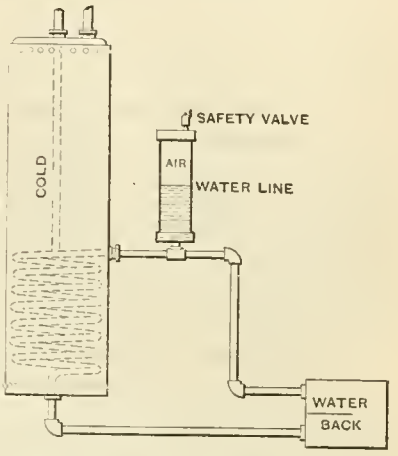


Fig. 2.—A Suggested By-Pass.

of the use of a by-pass our correspondent can readily see why Fig. 2 is not adapted to serve as one. Another character of by-pass is shown and described in the letter of "Oliver Twist," in *The Metal Worker*, June 9.

Choked Water Backs.

From P., *Paterson, N. J.*—Having noticed the letters of "E. J. Y." and "Swiped Joint" in the Letter Box, May 19 and June 2, I can say that the latter's suggestion of running a pipe through the boiler is feasible. There should be 1 square foot of surface exposed in the pipe for every 5 gallons of water in the boiler to insure the water being heated. A pipe running down through the boiler would not be enough. Boilers for heating the water by steam are made with coils of proper proportion in them. With such a boiler it would only be necessary to use a closed expansion tank attached to the pipe from the water back. This tank is simply an air chamber and should not be entirely filled, and should have a safety valve at the top, as shown by the



Choked Water Backs.

sketch. If it was made of 3-inch pipe, 18 inches long, and connected to the piping it would be ample. The pressure under which the circulation would take place would depend upon how much the air was compressed by the expansion of the water when it was heated. The water might be heated in the pressure system several degrees above the boiling point and would heat the water in the boiler faster in proportion to the increased temperature. If rain water or distilled water was used in the pressure system the water back or pipes would never become choked or reduced in capacity, and it is probable that there would not be sufficient deposit in the boiler or the cold supply or hot service to make trouble.

Miter Patterns.

From H. F. M., *Frankford, Pa.*—Will *The Metal Worker* kindly explain the method of obtaining the pattern for an ogee miter at other than right angles? I am aware that a miter line is employed, but do not understand its use, being only familiar with the short or usual method of obtaining the pattern for a square miter where the miter line is not used.

Answer.—As indicated by our correspondent, the pattern for a square return miter can be obtained from the profile, as shown in elevation. The pattern can also be obtained from the plan, a miter line being used in connection with the elevation. The latter method is usually employed for obtaining the patterns for a vase or urn having more than four sides, or for a return miter at other than right angles. If our correspondent desires a thorough understanding of the subject, he is referred to "The Metal Worker Pattern Book," pages 63 to 73, also to section 539 on page 153, and the accompanying figure on page 154.

Wants a Good Cement.

From R. P., *Huntsville, Texas.*—Will some of the readers of *The Metal Worker* please give a reliable recipe for fastening woolen cloth to tin or brass so that it will not peel off? I have a book on cements and glue, but find nothing satisfactory.

STOVE TRADE NOTES.

The Bryce Soft Coal Self Feeding Furnace.

The Bryce Furnace Company, 129 Huron street, Toledo, Ohio, have just published an illustrated catalogue of their furnaces and heaters. The catalogue, which is quite an artistic production, comprises 40 pages of very interesting reading matter on the subject of the Bryce self feeding furnace, which is specially designed for the use of soft coal. It is, however, equally adapted for hard coal or coke. Sectional cuts are printed to show the internal construction of this furnace and to explain the method of its operation. While the use of soft coal which cakes is to be avoided, the statement is made that all the other kinds of soft coal can be burned with good results, without the formation of smoke or soot, and with no more attention than is usually given to the operation of a hard coal base burner.

The magazine is of course immediately over the fire pot. The feed door is in the front of the furnace, high enough to deliver coal into the top of the magazine through a short chute. The magazine has a double shell to admit of the passage of gases and smoke from the top of the coal over the top of the interior shell down to the fire pot. After the fire is well started the draft is taken in at the magazine feed door, which then causes a down draft, consuming the gases and preventing the formation of smoke. Several styles of this furnace are shown. It is not only made for warm air but also for combination heating by warm air and hot water. The combination furnace has a water ring round the lower portion of the magazine immediately over the hottest part of the fire pot. These furnaces are furnished either in portable form or brick set.

The testimonials collected from users of the Bryce furnace scattered over a very large part of the West form a remarkably strong support of the claims made by the manufacturers that their furnace burns soft coal with economy and with very satisfactory results in heating. Agencies have been established at Columbus, Ohio; Buffalo, N. Y.; Minneapolis, Minn.; Goshen, Ind., and Iowa City, Iowa.

The Favorite Stove & Range Company

of Piqua, Ohio, and with branch at St. Paul, Minn., have issued a very handsome catalogue illustrating and describing the Favorite stoves and ranges, Favorite gas ranges and Favorite Piqua hollow ware. The binding is in embossed covers and the printing in black upon a fine quality of heavy calendered paper. Among the opening pages is a bird's eye view of the company's works and a steel engraving of W. K. Boal, president and founder of the company. The pages of the catalogue are of rather larger size than the majority of stove trade publications at the present time, and afford opportunity for the presentation of well executed engravings, accompanied by full descriptive particulars. The Favorite ranges occupy the first 40 pages, followed by the line of Birthday ranges, which are the same as the Favorite four-hole ranges, with the exception of the ornamentation. The Favorite cook stoves for 1894 for coal and wood comprise an interesting assortment of richly decorated constructions embodying the latest features. The line of Favorite gas ranges follows next, these goods being richly ornamented and offered in such variety as to meet all requirements. The heating stoves, led by the Favorite base burner, are treated in a comprehensive manner, and include the Carbon Favorite soft coal surface burner, Vesta Franklin, the West Point base burner, the Favorite base heater for wood, in which the application of the Todd stove principle is made to a cottage parlor; the Forest Favorite, Viola, Earl and Don. Several pages are given to the Favorite Piqua hollow ware and also to price-lists of stove trimmings, &c. An important announcement relative to the company's trade-mark as a means of advertising their entire line is printed in red on the last page. The catalogue considered as a whole is very attractive in its make up, and is a publication of which the company may justly be proud.

Consolidation of Vapor and Gas Stove Interests.

In the last issue we referred to the negotiations which have been in progress for some months past between Emerson McMillin & Co. of 40 Wall street, New York City, and certain of the vapor and gas stove concerns of the country, looking to the acquisition of these properties by the United Vapor & Gas Stove Company. Among the concerns interested is the Dangler Stove & Mfg. Company of Cleveland, Ohio, the president of which is David A. Dangler. In an interview the early part of the week with a representative of the Cleveland *Leader* Mr. Dangler is reported to have made the following statement respecting the movement in question :

"Under the circumstances I think it is time that the public should have a correct understanding of this consolidation of vapor and gas stove companies. It is true that the manufacturers in this line have perfected a combination of the following companies: The Quick Meal Vapor Stove Company of St. Louis, Johnson & Brandon of St. Louis, the George M. Clark Company of Chicago, the Baxter Stove Company of Mansfield, Ohio, and the Aurora Vapor Stove Company, the Schneider & Trenkamp Company, the Standard Lighting Company, and the Dangler Stove & Mfg. Company, all of Cleveland. We have already secured a certificate of incorporation under the laws of Illinois. We selected that State on account of its central location. The capital stock of the new company, which is called the United Vapor & Gas Stove Company, is $8,500,000. This amount is based upon the actual value of the franchises of the different companies, including real estate, other property, and some 150 fundamental patents which actually control the vapor interests of the world. The earnings of these companies last year would about pay 10 per cent. on the capital stock of $8,500,000."

"What is the object of this consolidation ?"

"First, increased advantages in combining the experience of all these manufacturers, in the purchase of material in greater quantities, and in the saving of royalties which the different manufacturers have paid to each other in the past. This last named saving alone amounts to fully $100,000 annually. Secondly, we shall so place the product as to sell direct to the retail dealer from the nearest point of shipment. In this way we can materially reduce the cost to the consumer by saving the profit of the jobber or middleman. In the third place, we shall save greatly in office and road expenses. The total saving, including rebates, to be made by the consolidation, we have estimated at $250,000 a year."

"When will your organization be completed ?"

"In the course of a week or ten days. The time fixed for the final transfer of all properties to the new company is August 1. It is expected that there will be one director from each company. The directors will select a president, first and second vice-presidents, a secretary and treasurer and an executive committee of five, as well as committees on sales, manufacturing, and finance."

"What financial provision have you made for carrying on such an immense enterprise ?"

"We propose to bond the company for $1,500,000. These bonds will run 30 years and will bear 6 per cent. interest, payable semi-annually, with the provision that at the pleasure of the company they can be taken up at any time at 110. Provision will be made for a sinking fund of $50,000 a year, with which to retire the bonds. Of this $1,500,000 some $600,000 will be used for a part of the purchase and the remainder will be utilized for running the business. Ninety per cent. of the stock of the new company has been taken by the owners of the old companies. The same energy and ability which have in times past insured the success of the old companies will insure the success of the new one."

ODD PLATES.

The Carton Furnace Company of Utica, N. Y., report a satisfactory volume of business thus far the present year as compared with the corresponding period of 1893, the falling off being only 4 per cent. In making this showing the company compare the period this year with the best five months' business in their history. In the number of furnaces sold from January 1 to June 1 of this year there is an increase of 15 per cent. as compared with the same time last year, which certainly speaks well for the popularity of the Carton heaters. Thus far the present year the company

have been shut down only two weeks, and their foundry is now in full operation. Their furnace pipe and fitting departments have been running overtime, and the company report a very small stock on hand, the new venture having proved more successful than anticipated. The fittings and pipes sent out have been favorably criticised, and the company expect to do a large business in this line.

F. E. Browne, 314-316 South Spring street, Los Angeles, Cal., favors us with an exceedingly neat and attractive catalogue with testimonial letters of his steel dome hot air furnace. This is the first illustrated catalogue which Mr. Browne has issued, and in it he states that in the future, as in the past, he will be on the alert to keep in the front rank, anticipating the wants of his customers and making his steel dome furnace occupy the highest and most advanced grade. The heater is especially adapted for the climate of California and burns either soft wood or coal. It has a small fire pot and a large radiating drum of heavy sheet steel, made perfectly gas tight. Three sizes are offered, the smallest being sufficient to heat a six to nine room house, the next size ten to twelve room houses, while the largest size is intended for churches and halls. The greater portion of the catalogue, which is entitled "Comfortable Homes and What People Say Who Live in Them," is devoted to half-tone engravings of residences in Los Angeles which are heated by the Browne steel dome furnace, and facing these views are testimonial letters from the owners of the dwellings. Mr. Browne also calls attention in the closing pages to his large and well selected stock of kitchen and household utensils, and to the fact that he has recently added to his assortment Magee's Mystic range, with which our readers are familiar. Mr. Browne also handles the Prize Royal, Dexter and Royal Grand ranges and the Orient lamp heater.

The Peninsular Stove Company of Detroit have addressed a circular letter to the stove trade, directing notice to their mail order department, a branch of business to which the company are giving particular attention. It very often happens that a dealer in need of stoves holds his order until a traveling salesman calls upon him, but the knowledge of the company's mail order department, where orders received direct command the same careful attention and prompt shipment which characterize those secured by the traveling salesmen, will warrant the dealer in mailing his orders without delay, thus enabling him to supply his customers more quickly than would otherwise be the case. The company state in this circular letter that on account of the extensive territory they are obliged to cover they find it impossible to send a representative into every town, and have therefore established the mail order department. We have received from the company a copy of this circular and also a folder relating to the Peninsular portable wrought steel range, adapted for use of families, restaurants, hotels and public institutions. The goods are made of 14-gauge cold rolled wrought steel and are lined with asbestos.

The Superior Stove & Furnace Company have just been incorporated under the laws of the State of Ohio for the purpose of carrying on a general wholesale and retail business in the sale of stoves, ranges, furnaces, kitchen ware, &c., with office and salesroom at 94 Superior street, Cleveland, Ohio. They have secured the general agency for the State of Ohio of the line of Superior furnaces, heaters and steel ranges made by the Superior Furnace Company of Little Falls, N. Y.

The Star Coupler Company, St. Louis, Mo., are meeting with excellent success in introducing their couplers. In using this coupler in connecting lead to lead pipe, the soldering or wiping of joints is entirely obviated. It is particularly adapted to connecting the range to boiler, and many stove dealers carry them in stock, as they are enabled to sell the range or stove and set it up complete without outside assistance.

The Putnam Foundry & Machine Company, Putnam, Conn., manufacturers of the well-known Plummer steam heater and the Leader hot water heater, have recently completed a new building to be used as a storeroom for patterns and a large shed for the storage of coal and coke. This concern are preparing to bring out a new furnace which will be ready for the market early in July. The furnace has not yet been named, and if any member of the trade has a suggestion and is anxious for the glory of standing godfather for this apparatus, he is invited to send it on a postal card. Mr. Barber has not offered anything in the way of a prize, but doubtless will appreciate the kindness of the trade to the extent at least of giving due credit to the sender of an approved suggestion through *The Metal Worker* and an invitation to the christening.

The Kernan Furnace Company of Utica, N. Y., and with Chicago office at 71 West Washington street, favor us with a descriptive and reference catalogue of the Kernan warm air furnaces for soft coal. The 32 pages of which the little volume consists illustrate and describe the heater named, in addition to which they give the elevations and floor plans of a school house, showing the application of the Kernan system of heating and ventilation. The latest production of the company is the Kernan smoke consumer, for which strong claims are made. In this construction, it is claimed, new and practical results are accomplished, the air being heated and equally discharged into the combustion chamber around the surface of the fire, thereby causing perfect combustion and preventing the formation of soot. In this air passage the claim is made that there are no joints which by contraction or expansion will allow gas and smoke to escape. The grate employed is of hexagonal type, being self cleaning, anti-clinker and rotating bar dumping. The bars are so constructed that air passes between and reaches the center of each. The triangular grate bars are without bolts, suspended within a removable grate frame which can be easily replaced through the ash pit door. The frame is so constructed that each triangular bar has a center support, thus giving three supports to each bar. The closing pages of the pamphlet are given up to testimonial letters, being a few of those received by the company from the soft coal sections of the country.

The Hood Furnace & Supply Company of Corning, N. Y., in referring to the special features embodied in the Cheerful Home improved hot air furnace, state that the line consists of 20 styles and sizes, which have been thoroughly tested by users in all parts of the country. The grate is a triangular revolving bar, cast hollow from end to end. The fire pot is sectional with cup joints and wide flanges, the steel dome has cast wings and the radiator is horseshoe in form, with return flue and down draft, and having automatic gas and direct damper.

E. Bement & Sons, Lansing, Mich., are distributing a 16-page pamphlet of pocket size, containing a number of testimonial letters relative to the merits of the Palace Regal Ventilator square parlor stove. The letters are of a complimentary character, and indicate very forcibly the satisfaction which this stove has given wherever used. The makers state that the reason for this wonderful success is its general superiority of design and construction, although they ascribe it largely to the fact that it is so constructed that the hot air and smoke are exposed for a longer time to a great radiating surface.

The Fuller & Warren Company, Troy, N. Y., have issued a very attractive four-page folder, illustrating the Air Tight Stewart ventilating parlor stove, made in four sizes and intended for using as a fuel hard or soft coal, coke or lignite. The manufacturers state that under test "a fire has kept continuously for 65 hours with one hod of soft coal." The stove is furnished with either cone or draw center grate, as may be desired, and the parts exposed to the heat above the fire pot are cast in one piece, thus insuring, it is claimed, great durability. The circular shows the stove with and without exterior casing. The space between the stove body proper and the outside casing is open from top to bottom, thus compelling a constant circulation of air by direct radiation upward and outward.

For some time past it has been evident that in order to accommodate their increasing business, the William Miller Range & Furnace Company of Cincinnati, Ohio, would have to provide additional quarters. To this end they have recently commenced the erection of a new brick building, which when completed will be six stories in hight. The location of the new edifice is at the corner of Seventh street and Broadway in the city named. The improvements will involve the expenditure of a large sum of money, which is necessitated by the prospective requirements of their business. When the building is completed a force of about 200 hands will be employed. President Miller of the company is reported by a local paper to consider the business outlook good.

Isaac A. Sheppard & Co. of Philadelphia and Baltimore have distributed a four-page circular illustrating and describing the Paragon steel plate furnace. It is made with round and octagon base, the former having a curved cylinder and frictionless draw center grate, while the latter has three different arrangements of grates and cylinders, according to requirements. The Paragon furnaces are well made throughout and embody features which have established for them a gratifying reception at the hands of the trade.

At the international exposition now being held at Lyons, France, is a grill room in which every effort is made to present a complete demonstration of the advantages of gas for cooking and for accessory services. Even the roasts are turned by a small gas motor. The kitchen is in full view of the hall of the restaurant.

TIN PLATES.

SCRAP.

CUMBERLAND STEEL & TIN PLATE COMPANY, Cumberland, Md., report that the demand for their black sheets for tinning purposes is so large that their order books are full for a long time ahead, and they are unable at present to fill the demand upon them. The present capacity of the mills is about 75 tons a month, which will be doubled when their new mills are put in service next month.

THE WORKS of the Burry Tin Plate Company, Llanelly, South Wales, will resume operations about July 1.

AN ENGLISH metal trade journal announces that some large orders for tin plates had been recently placed by American dealers. One purchaser had taken 24,000 boxes and another had placed contracts for 50,000 boxes.

AN AGREEMENT having been reached between the owner of the Abertillery Tin Plate Works, Newport, Monmouthshire, and his workmen, the works have been restarted, after a prolonged shutdown, with eight mills out of the eleven which the works contain.

THE DEATH is announced of a well-known Welsh tin plate manufacturer, whose products are familiar to every one in the trade in the United States—Daniel Whitehouse, proprietor of the Abercarne Iron & Tin Plate Works, Abercarne, Monmouthshire. Mr. Whitehouse, who was in his seventieth year at the time of his death, purchased the Abercarne works 40 years ago and made them one of the most important tin plate establishments in the world. He was the active manager of his mills and a very prominent and highly esteemed figure in the English tin plate trade.

PHILADELPHIA is rapidly assuming an unquestionable position as the Eastern center of the American tin plate manufacturing industry. Nine tin plate works, with an aggregate of 60 tinning sets, are now in operation in the Quaker City. All are reported as being busy and as finding a ready market for the whole of the bright and terne plates they can produce. The aggregate output of these nine works must form an important item in the tin plate supply of the Eastern States.

THE TIN PLATE works of Marshall Bros. & Co., 1156 Beach street, Philadelphia, are reported as being full of orders. Their rolling mills are also kept very busy in the production of black plates for tinning, part of the output being used at home and the rest finding a ready market among the Eastern tin plate makers. Messrs. Marshall's American black plates have achieved a high reputation.

RITER BROS. COMPANY, Philadelphia, Pa., importers and dealers in tin plates and metals, have removed their store and offices from 213 Race street to more commodious quarters at Tenth and Arch streets. The firm now occupy all the floors of a new and handsome four-story building, where they enjoy much greater advantages of space, and where they are prepared to do a still larger trade in their well-known special brands of tin and terne plates—namely, Riter's Roofing, Lehigh Ternes and Riter's Brights, as well as in all kinds of bright and roofing plates.

WITHIN the past two months the Falcon Tin Plate & Sheet Company, Niles, Ohio, have increased their facilities for the production of black plates for tinning by the addition of another pair of tin rolls. They have now in operation three pairs of tin rolls and two pairs of sheet rolls. The company have not as yet entered upon the manufacture of tin plates, but have confined their efforts entirely to the production of black plates, of which they turned out 850 tons in the first quarter of this year.

THE PHILADELPHIA IRON & TIN PLATE WORKS, Hughes & Patterson, Incorporated, Beach and Vienna streets, Philadelphia, issue a neat eight-page pamphlet, printed in red and black, as a price-list and advertisement of the American tin and terne plates made by them. These include their guaranteed plates—namely, H. & P. Best Bright, H. & P. Redipped Roofing and H. & P. Best Roofing—as well as a number of other brands of bright and roofing plates. The tinning plant of the Philadelphia Iron & Tin Plate Works comprises six pots.

THE TIN PLATE WORKS attached to the factory of the Chicago Stamping Company, Chicago, Ill., are busily employed in turning out both coke and charcoal plates at the average rate of about 750 boxes a week. All this product is used up on the spot for the purposes of tinware manufacture. The requirements of the Chicago Stamping Company's own factory are so great that hitherto they have not made any plates for sale. But it is in contemplation to add from 10 to 15 more tinning pots to the 4 now in use in order to supply the general market with high grade American bright tin plates. The company inform us that they have entirely abandoned purchasing imported tin plates and that thus far they have only tinned American black sheets. They express the hope that they may be able to purchase enough domestic sheets to keep their works going.

WORK is progressing actively on the construction of the new rolling mill and tinning plant of the Montpelier Sheet & Tin Plate Company, Montpelier, Ind. The company hope to be in operation by September 1 next, with a four-mill plant and about ten tinning pots.

THE AMERICAN TIN & TERNE PLATE COMPANY, 45–49 Richmond street, Philadelphia, are reported as having five tinning sets in constant operation, with an active sale of all the plates they can make. The company are turning out both bright charcoal and terne plates.

UNDER DATE of June 1, the Phillips Tin Plate Company, 918 Filbert street, Philadelphia, have issued a circular calling attention to the tin and terne plates manufactured by them at their works, situated at Susquehanna avenue and Philadelphia & Reading Railroad, Philadelphia. The concern are now making four brands of bright plates—two charcoal and two coke—and seven brands of roofing ternes, which they refer to as being all of Siemens steel, uniformly coated, resquared and guaranteed to seam and double seam. Five tinning pots are in constant operation, having a capacity of 50,000 boxes annually on single turn.

NORRISTOWN TIN PLATE COMPANY, Norristown, Pa., are busy with their full equipment of seven tinning pots turning out both bright charcoal and coke plates, as well as their three brands of roofing tin.

THE FOUR-MILL PLANT of the Ellwood Tin Plate Company, Ellwood City, Pa., is reported in full operation, turning out daily from 40,000 to 60,000 pounds of black plate, pickled and cold rolled, ready for tinning.

THE AMERICAN TIN PLATE MACHINE & MFG. COMPANY, Linfield, Pa., are reported as busily employed in the production of their specialty—continuous roofing plates, made by the Buckman process. The present capacity of the works is 10 tons per day, but additional machinery is now being placed which will double this capacity.

CHICAGO TIN PLATE MFG. COMPANY, 533 The Rookery, Chicago, expect shortly to join the ranks of American tin plate manufacturers who roll their own black sheets. The firm are, we understand, in negotiation for a rolling mill plant and will in all probability be producing their own sheets by the fall. The present product of the company's tin plate works consists of coke and charcoal bright plates, as well as ternes, to the extent of about 1400 boxes weekly.

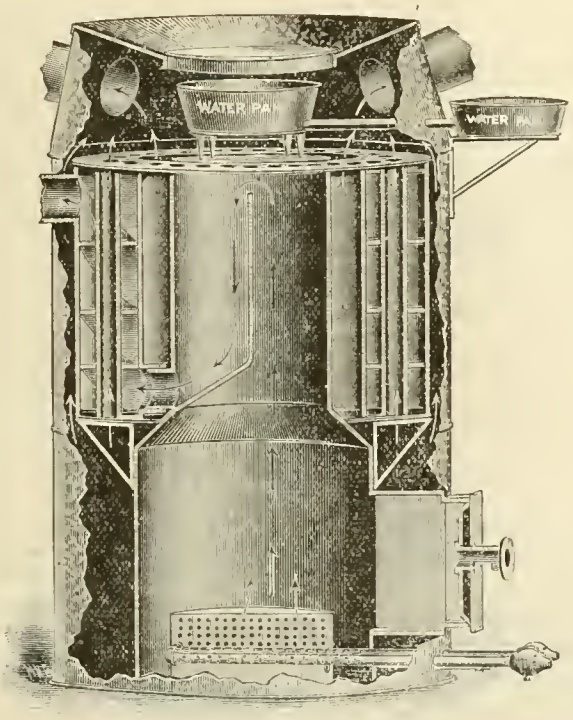
A GOOD EXAMPLE of the artistic tendency in modern trade circulars is found in an attractive 12-page pamphlet which has reached us from C. Sidney Shepard & Co., 23–25 Randolph street, Chicago. The circular is a beautiful specimen of typography and engraving, inclosed in a pale green cover, bearing the firm's name and business stamped in red letters on a silver ground, representing a sheet of roofing terne. It contains an illustrated list of the special brands of American and foreign roofing ternes made for and sold by the company. These include, among domestic plates, Westmoreland, a full weight, heavily coated plate, squared and stamped; Kenwood, a full weight, bright finished terne; Furmston, a terne of Worcester grade, and Apollo. Of imported plates, the well-known brands Worcester, Morriston Old Style and Pontymister Old Style are illustrated and described.

THE CYNON TIN PLATE WORKS and the Nantyglo Tin Plate Works of South Wales restarted this week.

The Spanish Government have proposed the appointment of a mixed commission to settle the difficulty between Spain and the United States in regard to the Cuban tariff.

A Gas Furnace.

The accompanying illustrations show a hot air furnace specially adapted to the use of gas as a fuel that is being put on the market by the Pennsylvania Gas Furnace Company, 77 West Chip



A Gas Furnace.—Fig. 1.—Sectional View.

pewa street, Buffalo, N. Y. Fig. 1 is a sectional view of the furnace, and the company call special attention to the fact that the fire chamber is large and extended and air is admitted to the burners on both sides. A central drum is connected with the top of the fire chamber and extends nearly to the top of the furnace, being crowned with a tight head. This central drum is provided with a partition causing the products of combustion to rise to the top before they can pass down to their exit to the outer drum at the back. The outer drum surrounds the central drum and has a series of hot air tubes passing up through it from the bottom to top. It also has a spiral partition wound four times around its interior, as shown in Fig. 2, by which means the heat of the gases is extracted previous to their taking final exit from the furnace. In this way a very large expanse of heating surface is presented to the cold air which enters at the bottom of the furnace. A very effective means of moistening the air is the arrrangement of the evaporating pan, which is located above the center dome and connected with an outside reservoir. In this way the moisture from the inner pan is distributed evenly through all the pipes leading from the furnace. The dome of the furnace is provided with an opening allowing ready access to the water pan. The outer water pan aids in replenishing with water and also prevents the water from being too quickly raised to a high temperature. It is claimed that the furnace is very durable, as there is no part which ever becomes red hot, and being made of steel plate it responds very quickly to the application of heat. It is said that in five minutes after the gas is burning a current of hot air may be felt in all the registers. Fig. 3 shows a top view of the burners and combustion chamber. A double pipe burner is used with fine perforations, being provided with an air mixer by which the proper amount of air can be supplied. This, with the size of the fire chamber, which provides for an ample flow of air to properly support a flame, produces, it is claimed, a superior combustion and intense heat. The air is admitted to the burner on both sides of the furnace through a perforated shield in fine streams over the top of the

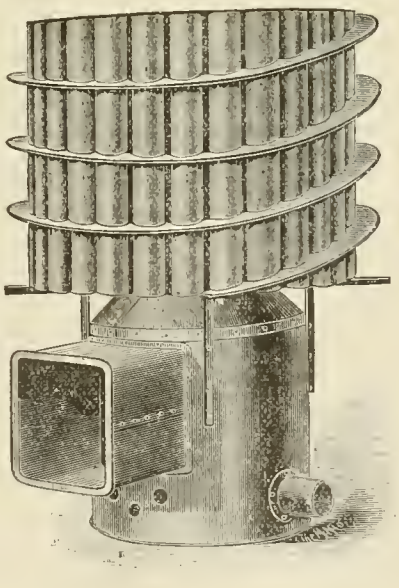


Fig. 2.—Radiating Drum with Spiral Flue.

burner, which gives a large flame. The admission of the air to the burner is said to be a very important feature. The furnace is arranged with a pilot light and devices by which the fire can be lighted from any room in the house. It is claimed that the combuation for an ordinary sized dwelling is from 20 to 40 cubic feet of gas per hour. The furnace is intended to take the place of coal constructions, both portable and brick set. In cost the furnace is said to be considerably cheaper than the average coal burning device, and that with gas at from 25 to 50 cents a thousand feet is more economical than coal, and with gas at 50 cents to $1 a thousand feet the cost of operation compares very favorably with the use of coal, while great comfort is derived from the regular heat furnished, as well as from the fact that no attendance is needed for fires. A number of the furnaces have been in use during the past winter, and they are claimed to have given entire satisfaction. The furnace is made in four sizes, Nos. 20, 24, 28 and 32, with a hight of 5 and 5½ feet and diameters of 40, 44, 50 and 56 inches, the capacity being 12,000, 18,000, 35,000 and 50,000 cubic feet of space respectively, with somewhat increased capacity in churches or buildings more readily heated than the ordinary dwelling.

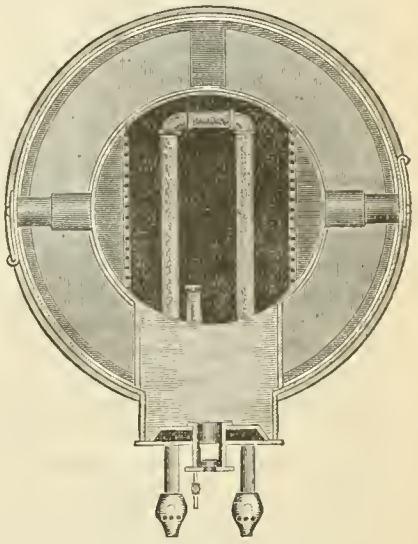


Fig. 3.—Top View of Burners and Combustion Chamber.

The New York and New Jersey bridge, authorized by Congress and approved by the President, will cost nearly $40,000,000, according to present estimates. The company are bound by the terms of the bill to complete the structure in ten years. Moreover, they are required to expend at least $250,000 the first year and $1,000,000 annually until the work is completed. They expect to arrive at this consummation in half the time required by the law.

With the view of warding off distress among the agricultural population in seasons of crop failure, Russian statesmen are preparing a scheme for the insurance of crops by the State. The insurance is to be compulsory so far as farming lands are concerned, the rates varying according to the conditions of the various districts.

At a recent meeting of striking coal miners in Illinois, it was desired to adopt a set of resolutions. In order that all present could vote intelligently, the resolutions had to be translated into French, German, Italian, Belgian and Polish.

PLUMBING and GAS FITTING.

Twelfth Annual Convention of the National Association of Master Plumbers.

The National Association of Master Plumbers held their twelfth annual convention in Detroit, Mich., this week. It was the largest ever held, and significantly demonstrated the growing power of this great organization, whose membership extends from ocean to ocean. Founded in 1883 by comparatively a corporal's guard, anxious to advance the interests of their craft, which they believed could beat be accomplished by organization, the association has grown from year to year, every twelvemonth showing a great gain on the preceding one. The past year was the banner year in its history, numerous localities coming into the fold which had for some reason or other held aloof.

So much has been accomplished, however, in State and local legislation for the betterment of the trade and the weeding out of unskilled or otherwise incompetent men through the influence of the association that its benefits have been too apparent to withstand, and therefore those who have hitherto been indifferent toward the association have latterly been hastening to enter its ranks. The matter of trade protection as embodied in the famous Baltimore resolutions, which in the beginning was a formidable undertaking, has also been prosecuted very successfully, and manufacturers and jobbers are finding it to their best interest to recognize master plumbers as exclusively entitled to handle plumbers' supplies. This work could not have been carried on to its present satisfactory condition without the most able management as well as the most perfect harmony among officers and members. Petty jealousies, bickerings and quarrels have not divided their councils, but unanimity of purpose has been the animating spirit. From this has grown the superb success exhibited by the association as it stands constituted today.

Delegations from the various sections of the country began to assemble at Detroit several days before the time fixed for the formal opening of the session on Tuesday. On the previous Saturday not a few arrived. Their numbers were considerably augmented on Sunday, but a great host made its appearance from all points of the compass on Monday. The Executive Committee of the association held a preparatory session on Monday afternoon at the Hotel Cadillac for the purpose of arranging some necessary details and giving the final touches to the report of their work during the year. This committee consisted of the following members:

President, Daniel G. Finnerty of Boston.

Vice-president, John Mitchell of New York.

Recording secretary, David Smith of Boston.

Treasurer, W. E. Goodman of Milwaukee.

Jeremiah Sheehan of St. Louis.

Thomas H. Radcliffe of Brooklyn.

J. J. Wade of Chicago.

H G. Gabay of New York.

James G. Weldon of Pittsburgh.

M. J. Duffy of Louisville.

TUESDAY MORNING.

The members of the various delegations assembled at the Hotel Cadillac at 9 o'clock, and formed in procession to march to Philharmonic Hall, the place of meeting. It was an imposing demonstration, by far the largest on any similar occasion. It was headed by a band of music, and paraded through a number of the principal streets and past the leading hotels. The different delegations had their banners with them, all wore distinctive badges, and in some cases a feature of uniformity was introduced in the matter of hats. For the first time the Knights of Tabasco, an organization of traveling salesmen in the line of plumbers' supplies, turned out in force as part of the plumbers' procession at a national convention. They had provided their own band, marched with military precision, carried appropriate streamers, and performed entertaining maneuvers with umbrellas decked with crimson ribbons.

On arriving at the hall the convention was called to order by President Daniel G. Finnerty, who looked around with evident pleasure on the large assemblage. The platform on which the officers sat was decorated with tropical plants, the walls were draped with flags and banners, above was a huge canvas inscribed "Welcome, Master Plumbers," but the most charming feature of the whole was a large gathering of ladies in the gallery who had come to witness the opening exercises. In a few well chosen words President Finnerty greeted the assemblage and introduced President J. H. Crumley of the Detroit Master Plumbers' Association, who welcomed his fellow craftsmen in a short speech. He next introduced George Beck, president of the Detroit City Council, who extended a cordial greeting to the association in behalf of the Mayor, who was unavoidably absent. Mr. Beck made an eloquent address, replete with humor and yet highly dignified. During the course of his remarks he referred to his own short career as a master plumber, which was hopelessly checked by the publication of one of his bills, in which he had charged $3.68 for finding leaks in a pipe and 16 cents for repairing the same.

The president then appointed Thomas F. Norris sergeant-at-arms, and Charles Dullea assistant, both of Detroit. A Committee on Credentials was then appointed, consisting of:

T. J. Culloton of Chicago.

W. H. Rothrock of Baltimore.

S. E. Dibble of New Haven.

D. J. Collins of St. Louis.

William McCoach of Philadelphia.

The convention adjourned until 2 p.m. to await the report of this committee.

TUESDAY AFTERNOON.

Chairman Culloton of the Committee on Credentials submitted its report, showing that 389 delegates were present, representing 22 local and 10 State associations. This is an increase of over 30 per cent. in the working membership of the convention in one year. A question arose as to the representation of the State Association of Michigan, which had sent in the names of ten members residing in towns without local associations in addition to three delegates at large. This question caused an extended discussion, which was terminated by the president's decision that the association was entitled to only three delegates.

The complete list of delegates in attendance, as reported by the Committee on Credentials, to which must be added the State vice presidents, who are ex-officio members of the convention, is as follows:

List of Delegates.

CALIFORNIA.

Los Angeles. George E. Howe, F. M. Parker, W. D. Newell, A. B. Cass, F. M. Crimmins; San Francisco, Thomas J. Ford, John L E. Firmin, J. B. Butterworth, P. F. Ward, R. A. Vance, S. Ickelheimer. W. M. Tobin, Charles J. Reilly, H. Williamson, James Shepard.

CONNECTICUT.

Bridgeport, H B. Middlebrook, M. A. Green, L. H. Mills; Connecticut

State Association, James Ahern, S. E. Dibble, John M. Page; Hartford, George Mahl, James F. Duffy; New Britain, J. B. Weiant; New Haven, Andrew J. Clerkin, S. E. Dibble, F. A. Curtiss.

INDIANA.

Evansville, Charles Wahnscidler; Fort Wayne, Robert Spice, E. Martin; Indianapolis, George Kirkhoff, Thomas Clark.

DELAWARE.

Wilmington, James F. Trainor, Alfred Gawthrop.

WASHINGTON, D. C.

J. R. Quinter, E. J. Hannan, J. Ragan, D. Harman, James Nolan, James Cunningham.

ILLINOIS.

Chicago, Paul Redeiske, J J. Wade, Wm. T. Geary, C. J. Herbert, P. Sanders, T. P. Culloton, G. A. Larsen, Thomas Conway, C. C. Breyer, D. J. Rock, P. M. Murphy, A. C. Hickey, J. F. Roland, Jos. B. Breen, M. L. Mandable, E Baggott, J. H. Devmey, J. H. Roche, Wm. H. Cummings, J. G. Weber, A. W. Murray, J. J. Doyle, R. H. Lear, J. P. Newburg, C. J. Boyd; Illinois State Association, John M. Simpson, Robert Loudon, James R. Scanlan; Peoria, D O'Connor, John O'Neil, Jr., Charles W. O'Neill; Rockford, E. S. Gregory.

IOWA STATE ASSOCIATION.

J. A. Harris, John E. Allen, John Burnside, A. H. Walker, Henry Ewinger.

KANSAS STATE ASSOCIATION.

James Foley, P. Bertram, C. J. Prescott, F. H. Bowers.

KENTUCKY.

Henderson, L. C. Klee; Louisville, A. M. Ramsey, S. Shulhafer, John Ryan, M. J. Duffy, Wm. H. Matlack.

MAINE.

Lewiston and Auburn, John B. Smith.

MARYLAND.

Baltimore, W. H. Rothrock, John Trainor, George Knipp, B. N. Sullivan, W. W. Rowles, J. F. P. Carey, E. J. Healy, Jr., C. H. Frederick.

MASSACHUSETTS.

Boston, J. W. French, J. W. Coadon, David Smith, J. F. Dablin, T. E. Sharp, P. H. Winn, E. C. Kelly, D. G. Finnerty, T. J. Hartnett, Isaac Riley, W. A. Tucker, J. S. Boyd, C. M. Bromwich, James O. Connell, A. Williams; Holyoke, C. P. Lyman; Massachusetts State Association, T. J. Carmody, D. D. Casey, J. W. Green; Lowell, Thomas Costello, P. F. Corston, D. H. Wilson, S. H. Jones; New Bedford, F. M. Gifford; Salem, F. A. Wendell; Springfield, W. H. Selvey, M. A. Donohue; Worcester, J. F. Deedy, H. A. Desper, J. W. Jordon, J. C. Luby.

MICHIGAN.

Albion, W. J. Poor; Ann Arbor, T. F. Hutzel, Robert Gwinner; Battle Creek, J. C. Gallup, A. F. Bock; Bay City, W. H. Sullivan, A. Walther; Benton Harbor, A. Brammal; Michigan State Association, James Meathe, John A Wheeler, William Lloyd; Detroit, George Lane, J. W. Partland, T. F. Norris, Richard Walsh, P. C. Stimer, Charles Dullea, J. H. Crumley; Flint, E. Werner; Grand Rapids, F. Shriver, Wm. Robertson, W. T. McGurrin, Warren C. Weatherly; Ionia, R J. Breckon, Loomis Mann; Jackson, S. J. Wirt, G. H. Porter; Kalamazoo, S. M. Radigar, J. Dekman; Lansing, F. C. Bennett, R. H. Black; Mount Clemens, Anthony Czizek, Michael M. Smith; Port Huron, W. Gibson, J. Bradley; Saginaw, C. R. Bridgeman, F. Archard; St. Joseph, M. W. Jackson, W. Dennes; Ypsilanti, J. E Lambert, Wm. Harding.

MINNESOTA.

Duluth, Allen Black.

MISSOURI.

Kansas City, H. Goss, R. B. Farley, George P. Kirtly; St. Louis, D. J Collins, P. Madden, W. Mortimer, E. J. Lonergan, E. P. Reardon, James McCartin, John McMahon, E. Schoeneman, John Quinn, J. C. Mitchell, J. Kelly, J. Shelley, W. F. Stein, J. M Life. E. F. Gardner, C. H. Carroll, E. C. Zausch, Jeremiah Sheehan; Missouri State Association, L. V. Cross, M. J. Ward, C. D. Rogers.

NEW HAMPSHIRE STATE ASSOCIATION.

F. A. Lane, P. A. Gifford, F. I. Lesaard.

NEW JERSEY.

Morristown, W. H. Moslar; Newark, E. Berla, A. Don; Passaic, John Hickman, L. McBride.

NEW YORK.

Albany, H. F. Wescott, Thomas Hyde, J. E. Dungan; Brooklyn, M. Fallon, T. H. Radcliffe, C. W. Evans, J. W. Kelly, W. J. Galt, H. L. Potter, J Zoll, R. J. Knox, W. E. Williams, Oscar O. Sawkins, George Mong, J. J. Keenan, G. B. Lewis, G. H. Smythe, W. Gardner, C. F. Menzinger, Louis Haff, H. J. McBride, John E. Quattlander, H. M. Noble, Edwin Hayward; Buffalo, J. F. Stygall, Jr., C. B. Huck, Charles Ceiger, J. L. Menach, F. L. Byer, George Engel. F. H. Yuhl, A. C. Cranichfeld; Jamestown, John Conway, James Callahan; Kingston, T. J. Cusack; New York, Col. George D. Scott. John Burns, John Mitchell, H. G. Gabey, H. J. Patterson, Charles Schloesser, T. J. Tuomey, William Young, John Yule, E. J. Brady, S. Malcolm, M. Ryan, John McCarron, J. W. O'Brien, Frank Reynolds, Timothy Sullivan, Phillip Smith, J. R. Corbitt, Alexander Cameron, W. McDermott, T. J. McCormack, Adam Huston, J. M. Morton, C. Frazer, T. Martin, E. P. Mahoney, J. Walsh, Jonas A Rossman, W. Kirchoff, C. H. Kranichfelt, T. McCaull, Francis Callahan, John Regan, J. J. Sullivan, James Muir, J. O. Shumway, T. R. DeLacey; Poughkeepsie, T. A. Waters, Peter Adriance, Charles Cook, E. C. Goherty; Rochester, J. A. Barr, J. A. Creelman, George Dodds; Syracuse, B. J. O'Donal, R. C. McClure, F. W. Wagoner.

OHIO.

Cincinnati, Charles Homan, A. A. Deihm, J. A. Gibson, C. L. Heller, Jr.; Cleveland, D. H. Roberts, E. Eller, W. N. Cleveland, W. J. Warden, Chas. Streever; Ohio State, C. C. Dewatoe, L. Poplowski, Robert Raitz; Toledo, J. A. Walt, J. S. Schultz, J. P. Lawrence.

PENNSYLVANIA.

Altoona, H. J. Bohn, Albert Akers; Harrisburg, John A. Kramer; Meadville, Joseph Hampson; Philadelphia, John E. Ryanaon, Wm McCoach, A. L. Hicks, W. M. Harkness, Jr., Wm. L. Owens, Jr., C. W. Barnes, W. H. Doyle, F. P. Brown; Pittsburgh, R. J. Bradshaw, J. O. McGinness, F. J. Gray, J. Rice, Frank McKnight, C. H. Humbert, A. R. Tate, J. J. Cowling, F. P. Blythe.

RHODE ISLAND

Newport, James Openshaw; Pawtucket, David L. Fales; Providence, P. Tirney, J. C. Conroy, F. C. Lees, W. M. Congdon; Rhode Island State, S. Jackson, T. L. Phillips, J. S. Fuller.

SOUTH CAROLINA.

Charleston, O. S. Miscully.

TENNESSEE.

Memphis, J. A. Bailey; Nashville, M. P. Baine, G Denerich.

TEXAS STATE ASSOCIATION.

C V. Ackley, A H. Wainright, J. F. Madden, Thomas Henderson.

WISCONSIN.

North Shore, John Eiden, C. H. Goodman; Milwaukee, Charles Poluchek; W. E. Goodman, Fred Wittig, W. H. Halsey, A. R. Schwind, E Crassler, L. H. Plum; Racine, H. Raymond, C. Hullett; Northwestern of Oshkoah, W. S. Patterson, J. F. Ahern, M. A. Dunning; West Superior, Joseph Neil.

The following Committee on Resolutions was next appointed by the president:

E J. Hannan of Washington.
Edwin Hayward of Brooklyn.
S. L. Malcolm of New York.
J. Warren French of Boston.
L. B. Cross of Kansas City.

The following Auditing Committee was also appointed:

John Trainor of Baltimore.
J. A. Harris of Sioux City.
R. J. Knox of Brooklyn.

An adjournment was then taken until 9 o'clock Wednesday morning.

WEDNESDAY MORNING.

The delegates gathered slowly in the convention hall this morning, and it was nearly 10 o'clock when the president's gavel called them to order. John Trainor of Baltimore moved a reconsideration of the vote by which the report of the Committee on Credentials had been adopted. The discussion of this question consumed much time and required a roll call for its settlement, but it was defeated.

Edwin Hayward of Brooklyn, chairman of the Committee on Essays, reported that contributions had been received from Dent Yates of Kansas City, P. L. Moffitt of Brooklyn, S. E. Dibble of New Haven, ex-President Jeremiah Sheehan of St. Louis, Theodore P. Watts of Louisville, L. F. Meyer of Milwaukee, C. C. Dewstoe of Cleveland, the Sanitary Committee of the Master Plumbers' Association of Worceater, Mass., John L. E. Firmin of San Francisco, and E. J. Healy, Jr., of Baltimore. The time for hearing these essays was fixed at 1 o'clock on Thursday afternoon.

Alex. W. Murray of Chicago, chairman of the Sanitary Committee, read the following report, which was signed by himself and A. C. Hickey, M. L.

Mandable, David Whiteford and T. C. Boyd:

Report of the Sanitary Committee.

Your Sanitary Committee respectfully report as follows: Were it possible for your committee to intelligently investigate every subject that might properly be within the purview of the little "Sanitary," a proper discussion of the report would demand too much of the limited time of this convention.

Article 2 of your constitution contains the theory by which the office of Sanitary Committeemen was established. One of the tenets being "This association is organized for sanitary purposes," it is therefore the duty of the members to qualify by training so that their sphere of usefulness may be enlarged, and be able by logical reasoning to convince the public of the benefits to be derived from the adoption of improved methods of construction, the best quality of materials, and of the importance of employing skillful workmen. The tendency of the age being to the encouragement of the specialist, by which greater perfection is attained in the useful arts, the public expect from the hands of the plumber the same rate of progress in ministering to their comfort, but to be properly qualified to judge which are the correct methods for obtaining perfect sanitation in house construction requires more talent than has yet been developed in any one man. Therefore when the source of water supply has been discovered and the chemist has analyzed its properties, and the physician has stated that it is good for domestic use, it yet requires the plumber to be intelligent and skillful in the use of the material and appliances for it to be stored and utilized and the final disposition of its wastage, so that the education of the craft, beginning with the apprentice, should ever be one of the fundamental principles of this association. And while this association is doing its part by self-training, it is evident that the public, to be fully benefited, must encourage the enactment of such laws that will prevent the ignorant and unskilled from supervising or practicing the art of plumbing, making the examination of those engaged in plumbing and house drainage by a competent board compulsory; requiring the issuance of certificates of proficiency to those who have passed a creditable examination; granting certificates for work properly executed and compelling a periodical inspection of buildings by the sanitary police.

Words of ours are not needed to convince the plumber of the many benefits mankind would derive from the general practice and adoption of the foregoing, because his every day experience has given evidence of their necessity; but the public have not the same opportunities to observe the causes demanding such strict measures. It is irrational to expect an inexperienced or slothful workman to do a first-class job, though he had the best of material to use. Were they compelled by law to have a diploma certifying to their ability, it would give more assurance that the concealed work, as well as that which is exposed, had been properly done, and if to this was added the certificate of the Department of Health that the work had stood the properly applied tests and was executed in accordance with the sanitary code of the city laws, badly executed plumbing would disappear.

House to house inspection would lead to the detection of much that causes sickness and death. It would discover the clogged and leaking sewers, waste and supply pipes, thousands of plumbing fixtures and ice boxes without traps, thousands of water closets reeking with filth and without sufficient water supply, hundreds of basements used as the public dump of the building, many of which germ beds of disease are simply used as storage for fuel. Yet too many are the storage rooms of many food products, and of those that are the kitchen of the gilded restaurant and saloon, their name is legion.

House to house inspection, with authority to remedy these evils, would do much to lessen the epidemics of smallpox, fevers and cholera. Much of the defective supply to water closets in buildings of some cities is caused by waste of water from leaking faucets or pipes. Their dribbling leaks make the premises damp and prevent the water flowing to the upper floors of buildings. The general use of water meters would very much reduce this waste and afford an abundance of water where there is now a scarcity. The disposal of waste water from ice boxes or refrigerators does not receive as particular attention from the householder as its importance from a sanitary standpoint deserves. When making examinations of premises a close scrutiny of the manner of getting rid of the waste from the ice will reveal much that is defective.

A general word on sanitation: Wherever man inhabits the earth effective sanitation is visible, either in a low death rate where civilization and the advancement of the race is marked, or the opposite. Where a low grade of humanity congregate together and disregard the laws of sanitation by living in filth the death rate will be enormous. Especially will the hand of death show itself should an epidemic stalk abroad. Cleanliness, pure air, pure water, healthy food and proper clothing are the first laws of sanitation, which must be obeyed by the human family if they want to be healthy. Do you consider how the laws of nature shake off the cloak of disease from her shoulders? For instance: Contaminate a pure stream of water with any vile substance. Note that the very instant you stop polluting the stream it begins to purify itself by depositing the sediment on the bottom and throwing off the noxious gases to the air. Before the river has traveled 50 miles nature will have asserted herself and the river will again be fit for man and beast to partake of.

Again, nature inclines to sanitation. Take any large city; the inhabitants contaminate the air by all kinds of gases, dust, garbage, outhouses, defective sewers, polluted water, damp cellars, dead animals and filthy gutters, which are contrary to the laws of sanitation. If this were not remedied man could not live on this earth; because of his own neglect he would perish.

It is of no use to remind you of the disregard of sanitary laws by our forefathers for the past 3000 years; of whole countries being laid waste by black death through their disregard to sanitation. It does not matter whether you disobey them through ignorance or carlessness; whether you live in a hovel or palace, your neglect will find you out. Read ancient history and you will find our words as true as holy writ. Is it not a fact that man is slow to move in the direction of sanitation? Thousands of dollars are lavishly spent in the beautifying of buildings, while the sanitary appliances do not receive the consideration they deserve. There is no question but that the public are slow to get on the fast train, the wheels of which are run on the line of sanitation. But we are advancing slowly, and all along sanitary appliances are being gradually introduced.

The master plumbers have been in the vanguard in advancing sanitary laws and sanitary plumbing for the last ten years, and we believe we have done more than any other class of men to make healthy homes. Even the physicians acknowledge the plumber as a sanitarian in the prevention of diseases. Boards of health and officials consult us on sanitary law. Your committee would recommend that all local associations should take up for the coming year laws governing plumbing and undertake to have them passed through their reapective legislatures and city councils. In conclusion, to make the home of the soul an earthly paradise:

The heart must pump, in temperate mood,
Life blood through each artery and vein,
The stomach wisely fed, with wholesome food
And rest afforded the weary brain,
The body of its wastage purged,
And cleansed by exercise and bathing,
The senses by excess not blurred,
And lungs pure air inhaling.

The recommendations of this committee were adopted unanimously.

C. S. Paul of Los Angeles, chairman of the Apprenticeship Committee, presented the report of that committee, which was read, but on motion was referred back to the committee with instructions to make some changes. Subsequently the matter was referred to local associations.

State Vice-Presidents' Reports.

Reports of State vice-presidents were next called for. Patrick Tierney reported that Rhode Island was well organized, every city having its own local association.

The report for Michigan, made by F. Shriver, stated that great progress had been made in the membership of local associations.

James F. P. Carey, reporting for Maryland, alluded with gratification to important legislation secured.

Complete harmony among the fraternity was reported for Connecticut by James Ahern.

Protective legislation was reported as making encouraging progress in Tennessee by J. L. Park.

The little State of Delaware came up with a very encouraging statement of progress by Alfred Gawthrop.

New Hampshire was shown to be in good condition by the report of R. G. Donnelly.

The Kansas report, by James Foley, dwelt upon the improvement in plumbing work accomplished by the efforts of the master plumbers' associations.

Minnesota was shown by Allen Black to be a rather discouraging field for association work, but there was no evidence of any disposition to weaken his efforts to advance the interests of the general cause.

An entertaining but instructive report was rendered for Massachusetts by John F. Deedy, who gave details of methods pursued in pushing the work of organization in that State.

A very prosperous condition of affairs was reported for Washington, D. C., by James Ragan.

In marked contrast with this rosy statement was the report for Nebraska by James H. O'Neill, who set forth the depressed business situation in that commonwealth.

An excellent report for Missouri was presented by J. M. Life.

Indiana was shown to be a difficult field in which to work, according to Geo. F. Kirkhoff.

A brief but good report on Southern California was made by Geo. E. Howe.

A satisfactory state of affairs in New York was presented by Wm. N. Tobin.

Iowa was shown to be exceedingly well organized by Henry Ewinger, who, however, deplored the slowness with which sanitary legislation was being perfected by the State.

Trade protection appears to be pretty generally enjoyed in Texas, according to the report of Ed. Braden, Jr., who also submitted copies of ordinances of Texas cities governing the plumbing business, to show the progress being made in that State.

An adjournment was then taken until 2 o'clock.

WEDNESDAY AFTERNOON.

A congratulatory telegram was read from President E. Rutzler of the Master Steam Fitters' Association, in session in New York, as follows:

We send congratulations on your successful meeting and hope each association will secure complete trade protection.

A telegram in the same vein was ordered to be forwarded to the Steam Fitters' Convention.

Ferdinand Wittig's report for Wisconsin was then read, setting forth the progress made in his State in the past year, and giving some details regarding specific points of advancement.

E. J. Hannan, chairman of the Committee on Resolutions, then read his report, which covered a number of subjects that had been referred to the committee for their consideration. One relating to apprenticeship was recommended by the committee to be referred to the Executive Committee, to be reported upon at the next convention, which was accordingly adopted. Several resolutions covering proposed changes in the constitution were read, and on motion referred to a special committee of five, to report at the next convention. A resolution from the Master Steam and Hot Water Fitters' Association of the United States, asking the co-operation of the National Association of Master Plumbers in the matter of purchasing supplies, was referred to the incoming Executive Committee with power to act.

A resolution presented by J. J. Wade of Chicago set forth the fact that many architects and builders persisted in specifying foreign pottery, and he therefore recommended the appointment of a special committee of five to investigate the comparative merits of foreign and domestic pottery and report at the next annual convention. The Committee on Resolutions recommended that the resolution be non-concurred in, but that "all master plumbers give their preference to home industries in the purchase of supplies." The convention approved this recommendation by a unanimous vote.

Thos. P. Watts, vice-president for Kentucky, then made his report for that State, showing a very creditable record of work. The condition of association matters in Pennsylvania was well portrayed by J. L. McShane, who also referred in suitable terms to the demise of James G. Weldon of that State.

The report of W. T. Geary for Illinois gave particulars of the recent formation of a State association in that commonwealth, and the gratifying manner in which his efforts in that direction had been supported by the Illinois master plumbers.

The report of the financial and recording secretary, David Smith of Boston, was then read, showing a grand total of dues collected for the past year of $5841. The convention then adjourned until 9 o'clock Thursday morning.

Wednesday evening was pleasantly passed by the members of the association, their ladies and friends at the Ben Hur farm of A. J. Alexander, near Walkerville, Ontario. Mr. Alexander, who resides in Detroit and is known to fame as the manufacturer of the Ben Hur closet, furnished a steamer free of expense for the trip to the farm, and there provided a bountiful repast, which was partaken of at tables spread in a great apple orchard. It is estimated that over 1000 persons were entertained on this occasion by Mr. Alexander.

THURSDAY MORNING.

(By Telegraph.)

Convention was called to order at 10 o'clock. No committees being ready to report promptly it was proposed to begin the reading of essays, but the delegates were not in a mood to listen to them, and by motion a resolution was adopted ordering them printed as part of the proceedings.

The report of the Executive Committee was then read. They reported that they had held four meetings during the year. The first was at Pewaukee Lake, Wis., on June 16, 1893, at which the proceedings of the convention just held were ordered to be printed and distributed, which was done in seven weeks. Also at this meeting the salary of the executive clerk was fixed at $18 per week and the *per capita* tax for the year at $2. Further, the president was directed to write to the presidents of local associations and get the names of all manufacturers of plumbers' supplies in sympathy with the aims of the association. This was done, and a list was afterward printed showing 210 names, to which 16 more were subsequently added. The second meeting was held at Boston, February 13 and 14, at which it was decided that the appointment of a joint committee representing the Master Plumbers' Association and the Steam and Hot Water Fitters' Association was advisable, and the latter association was so notified. At this meeting it was resolved to recommend to the association that representation in the National Convention should be reduced to one delegate to every 15 members in local associations instead of one to ten, as at present. The third meeting was held at Hotel Cadillac, Detroit, June 18, at which it was resolved that the association should furnish all supply houses with lists of members of local associations. A proposition was received from the United Association of Journeymen Plumbers asking for the formation of a joint committee, composed of representatives of the two bodies, to adopt measures for the avoidance of strikes and disagreements; recommending the adoption of a plan of arbitration and also the settlement of the apprenticeship question. The fourth meeting was held at Ben Hur farm, Canada, June 20, at which an appropriation of $500 was made to help to defray the expenses of the Detroit meeting, as the Detroit local association was a new one. The recommendations of the Executive Committee were referred to the Committee on Resolutions, to report what action they might deem advisable.

The following special committee was appointed on the proposed revision of the constitution, to report at the next convention:

Edwin Hayward, Brooklyn.
Paul Redeiske, Chicago.
J. W. McDermott, New York.
H. Humbert, Pittsburgh.
George Knipp, Baltimore.

Treasurer W. E. Goodman next read his report, showing an amount on hand at the beginning of the fiscal year of $3034.20; received during the year, $5907.85; making a total of $8942.05. Expended during year, $4383.21, leaving a balance now on hand of $4558.84. The reading of this report excited much enthusiasm.

A Committee on Resolutions on the death of James G. Weldon of Pittsburgh was then appointed as follows: John Trainor, Baltimore; Wm. McCoach, Philadelphia; J. L. McShane, Pittsburgh, who subsequently reported a series of very appropriate resolutions which were adopted by the convention by a rising vote.

At the suggestion of Andrew Young of Chicago that the association should annually be represented at the meetings of the American Public Health Association, a motion was adopted that hereafter the president of the National Association of Master Plumbers should attend as regular representative of the association.

It was next decided to vote on the proposed change of the basis of representation of local associations in the national convention, when a large majority voted down the attempt to limit the representation to one delegate to 15 members.

The place of holding the next annual convention was taken under consideration, and after the claims of Philadelphia had been eloquently set forth by Messrs. McCoach, Hayward, Cross, Doyle, Collins, Redeiske, Dewstoe and Burns, nominations were closed, making the choice of Philadelphia unanimous.

Paul Redeiske of Chicago moved that hereafter the Executive Committee should endeavor to arrange the time for holding the convention so as not to conflict with other conventions in allied trades, which brought out the statement from the president that he had endeavored to so arrange matters this year, but that it was the fault of other associations that there was a conflict of dates.

Dr. Reynolds, Chief of the Board of Health of Chicago, was then introduced to the convention and made a graceful and complimentary address, stating, among other things, that every year Chicago adds new buildings that if placed in a straight line would extend 50 miles, every one of which is twice inspected during erection under plumbing regulations approved by the National Association of Master Plumbers.

President Finnerty's report for the past year was then read, giving a remarkable statement of a vast amount of work performed in extending the influence and building up the membership of the association. There are now 2921 members, an increase of 464 over last year. Over 100 firms signed the Baltimore resolutions. A vote of thanks was given the president for his able report.

E. J. Hannan, chairman of the Committee on Resolutions, presented a report on the recommendations of the Executive Committee, favoring the adoption of all, but suggesting that with relation to arbitration all such committees should be appointed from local associations and not by the national body. The report was unanimously approved.

The Texas delegation extended an invitation to the association to meet at some point in that State in 1896, promising a very cordial reception and excellent entertainment. The convention then adjourned until 2 o'clock, and immediately after adjournment the members and ladies met in the open air near by and were photographed.

THURSDAY AFTERNOON.

The convention met at 2 o'clock and immediately went into executive session. The doors were opened at 5.10 o'clock, and the first business presented was the report of John Trainor, chairman of the Auditing Committee, who reported that he had found the accounts of the officers correct.

The convention then proceeded to the election of officers. The president appointed as tellers: Frank Reynolds of New York, Edward Baggot of Chicago and T. J. Hartnett of Boston.

Candidates for president were nominated as follows: Daniel G. Finnerty of Boston, John Mitchell of New York, Jas. J. Wade of Chicago, Jas. R. Meath of Detroit, Daniel L. Sullivan of Texas. The merits of each candidate were set forth in eloquent terms by good speakers. Nominations were closed and the balloting began, in which very great interest was taken. Five ballots were necessary to record the choice of the convention, which resulted in the election of John Mitchell, who was then escorted to the platform and expressed his thanks for the honor conferred upon him.

Nominations for vice-president were next made, as follows: William H. Doyle of Philadelphia, and L. B. Cross of Kansas City. Mr. Doyle declined the honor, and moved that the secretary cast one ballot for Mr. Cross, thus making his election unanimous, which was accordingly done. Mr. Cross was then escorted to the platform and thanked the convention for the honor.

The only other elective office was that of treasurer, for which William E. Goodman of Milwaukee was nominated and unanimously elected. Mr. Goodman was escorted to the platform and gave expression to his thanks.

President Mitchell announced that he would appoint as financial and recording secretary Henry J. Petersen of New York, and his choice was immediately ratified by the convention.

Paul Redeiske of Chicago moved that a vote of thanks be tendered the retiring officers, the citizens of Detroit and the press, which was adopted. Thanks were also voted to A. J. Alexander of Ben Hur farm for his entertainment of the association, and to the ladies of Detroit, for entertaining the ladies of the members. The roll of vice-presidents was called, and the delegations from the several States named their choice for the ensuing year. Many were continued from the previous year.

The president announced the following members of the Executive Committee:

Jas. Meath of Detroit.
Henry G. Gabay of New York.
John Trainor of Baltimore.
C. C. Dewstoe of Cleveland.
Paul Redeiske of Chicago.

Adjourned *sine die* at 11 o'clock p.m.

PHILIP SMITH of New York, observing that the president was provided with a gavel of very ordinary appearance, deemed it desirable for the maintenance of the dignity of the office that a better emblem of authority should be in his hands. He therefore procured and presented to President Finnerty a handsome rosewood gavel, decorated with a red, white and blue ribbon.

Pads and Joints.

A PARLOR at the end of the main corridor of Hotel Cadillac was used as an exhibition room, and a greater display of manufactured articles made than has heretofore been customary.

THE ROTUND FIGURE of John Davis of the Windsor Mfg Company, Milwaukee, was seen everywhere, but lead and tin pipe talk was left at the press.

THE SEDATE FACE of the eloquent and humorous Albert E. Hyde relapsed into a genial smile for each plumber, for he knows them all as well as he does the James B. Clow Company's catalogue. His fellow laborer, W. H. Morse, was equally at home with the delegates.

THOMAS SPENCE of the Rundle & Spence Mfg. Company, Milwaukee, left Mr. Rundle at home to make soil pipe and plumbers' brass goods, while he renewed his acquaintance with the fraternity in which he labored when he first worked for shillings.

VALVE BOXES, hydrants, malleable and cast fittings for plumbers and steam fitters are agreeable topics for conversation when talked by Fred Habne of the Illinois Malleable Iron Company, Chicago.

AN ATTRACTIVE square sign with a white background bore in red and black letters, "H. B. Smith Company, Westfield, Mass. Union and Gold Pin Radiators, Gold, Mills and Mercer Boilers and Cottage Heaters." A table beneath was laden with literature and J. H. Towle had a word for all.

A. P. RICHARDSON of the American Boiler Company was at home in every group of plumbers with his smile and greeting, but not a word about the Perfect, Florida, Spence and Soleil steam and hot water boilers.

M. L. FOOTE is an agreeable representative of the heating and ventilating department of the Kewanee Boiler Company, Kewanee, Ill.

GRANT C. BRETTELL showed the Eureka smoke test machine, made by the Bailey-Farrell Mfg. Company, Pittsburgh. It attracted much interest and is highly praised by the Pittsburgh plumbers, who strongly advocate the smoke test in preference to all others. Leaks are readily found that would require careful search with any other method. He also distributed circulars of the Bennett water pressure regulator for delivering water from high pressure street mains through the consumer's service pipe at any desired pressure from 1 pound up. His attractions kept him busy, and he worked willingly to satisfy all, but too hard to enjoy the convention.

A TABLE laden with attractive printed matter was presided over by L. F. Daniels, representing the Boynton Furnace Company, New York and Chicago.

SECRETARY W. EMIL KUGEMANN represented the Ideal Boiler Company of Chicago. He had a large trade-mark in colors on the wall, and an ideal boiler set up and some loose sections to show the construction and circulation. A number of their specialties in valves and regulators were also shown, attracting many visitors to the exhibit.

W. H. HAYES and G. F. HICKMOTT, representing the Hayes Mfg. Company, Paterson, N. J., showed a Wilhelmi copper range boiler, guaranteed to stand 200 pounds pressure, also a section of the boiler showing their method of bracing the boiler and connecting the parts.

J. J. RICKETT, 3948 Fifth avenue, Pittsburgh, displayed all varieties and shapes of his rubber water closet connections on an ingeniously contrived stand made of nickel plated pipe.

CHAS. A. CRIQUI of the Criqui Filter Company, St. Joseph, Mo., exhibited nickel plated samples of their germ proof filter. It can be attached to a sink or lavatory and filter all the water that passes through. The filter is an unglazed china jar, and is

said to work for several months before it needs cleaning, which can be readily done by shutting off the water and removing the filter jar. It is cleaned by a brush, or if thickly coated fine emery paper will clean it.

G. F. HICKMOTT showed samples of the Brockton files and rasps for soft metals and woods made by Walter Cobb, Jr., Brockton, Mass. He showed one that had been in use a year that cut free and did not clog when used on lead.

SECRETARY J. E. HOLLAND had a sign, "Holland Radiator Company, New York and Chicago," hung on a column around which was grouped samples of the Holland radiator in different styles of decoration. The advantage of their method of construction and connection was explained to all.

COL. W. T. MCGURRIN of Sproul & McGurrin, dealers in plumbers' supplies, Grand Rapids, Mich., showed circulars of the Excelsior grease and sewer gas trap and the Salvage closet connection. The closet connection was shown complete, and is for repairing earthenware closets when the flush or revent horn is broken. It is very easily attached.

THE HYGEIA FILTER COMPANY, Detroit, Mich., had samples of their filter on exhibition both for use on one fixture or for filtering the water supply of a building. G. L. Benedict explained its operation and distributed a 12-page pamphlet showing sectional views and thoroughly explaining its advantages, construction, operation and method of attaching it.

EMMETT MARTIN, Fort Wayne, Ind., showed a catch basin and back water trap that received considerable attention.

JOHN COYNE, representing the Detroit Lubricator Company, showed a line of steam and hot water valves to the delegates.

W. P. POWERS of the Powers Duplex Regulator Company, Chicago, was present and showed his regulator in connection with the Ideal boiler of the Ideal Boiler Company, in charge of W. Emil Kugeman.

JAMES H. DAVIS, the Western manager of the Standard Radiator Company, Buffalo, N. Y., came from Chicago and had a Turkish rug on which he displayed the New Standard radiator in a single loop decorated with gold brouze and silver bronze ornamentation and a three-column radiator decorated in the same style. The four-column radiator had a silver bronze background and gold ornamentation. These radiators are all tested by a pressure of 75 pounds alternately of steam and cold water before shipment. The company have recently put in operation a 75-ton cupola, which doubles their output, and their orders have kept them working overtime for several weeks. Their yearly capacity will now reach about 3,000,000 feet of radiation.

A STEEL BATH finished in handsome style was conspicuously displayed in the exhibition hall and the printed matter of the Steel Bath Mfg. Company, Detroit, was freely distributed. The tub spoke for itself, its many advantages being readily seen by the plumbers.

A. C. JOHNSTON and F. W. Herendeen of the Herendeen Mfg. Company, Geneva, N. Y., Chicago house had a Faultless Furman boiler in the exhibitors' room. They distributed a neat leather card case containing a circular of the Furmau., Jr., hot water boiler and the dimensions and ratings of the Faultless Furman steam and hot water boilers.

IN THE center of the exhibition hall, so that all who came down from the hotel could see it, a picture of the Capitol Building in a quartered oak frame was hung above the mantel with an American eagle holding the Star Spangled Banner above it. The frame bore a horseshoe in red with the words "Capitol Luck" on each side. Below, and in front of this attraction, the United States Heater Company of Detroit showed their Hecla and Mascot steam boilers and two sizes of the Capitol hot water heater. These were lighted inside by electric lights and red ribbon was used to show the passage of the products of combustion through the heater. On a table in front a display was made of the Capitol steam and hot water valves, altitude gauges and thermometers, with catalogues and circulars. The features of the rocking and dumping grate, grate surface, style of fire surface, draft flues, separating chamber and construction were explained by J. H. Bacon and A. T. Henderson, who had many interested inquirers.

THE J. H. MCLAIN COMPANY of Canton, Ohio, made a fine exhibit of their hot water and steam heaters. Five samples were shown, comprising the Harvard, Humber, Yale and Sandow for hot water and the Cambridge for steam. These were all painted white, with bands and letters gilded, making an extremely attractive showing. For the purpose of showing their interior construction an incandescent electric light with a long wire was available, which was in almost constant use when any plumbers were near, as everybody desired to see how fire pots looked and how circulation was provided for. A brand new catalogue, elegantly gotten up, was distributed on this occasion. C. B. Matteson was in charge of the exhibit and presented each caller with a morocco bound memorandum book as a souvenir.

IN PARLOR M, J. E. Zimmerman had a fine display of flush tanks in a variety of styles and shapes, and water closets, with a line of plumbers' brass specialties and the Ideal easy packed quick opening radiator valves.

CIRCULARS were distributed by W. A. Kelly, Cleveland, Ohio, of the Electric water closet, which was set up for inspection in operation at the Detroit Lead Works, not far away.

WM. KERR, Cleveland, Ohio, showed samples of a patent sink and basin trap that is a good grease trap and is sealed by a ball when the water seal is broken.

H. A. DESPER, Worcester, Mass., showed a soil pipe testing valve that is just the thing, and Balsago is a material that is said to make soil pipe air and water tight.

E. C. MILLER showed a variety of soil pipe fittings made by the Perfection Cleanout Company, Haverhill, Mass., every one showing how their Perfection cleanout is used on L's, Y's, one-quarter and one-eighth bends, traps and double hubs. He also showed the Perfection roof collar, with which a tight connection can be made.

H. B. STOCKWELL represented Charles Royle, Brooklyn, and Wm. Foerster & Co., New York, and showed a handsome line of brass gas fixtures and glass globes.

THE HYGIENE GAS STOVE COMPANY, Pittsburgh, showed a gas stove adapted either for cooking or for heating soldering coppers or melting solder in the metal pot.

THE INSTANTANEOUS WATER HEATING COMPANY, Chicago, had a sign 5 feet square above their exhibit which had a black velvet background with their water heater setting above a bathtub in bas-relief made of silver plated sheet metal. The name and the addresses of the company in New York and San Francisco and in Manchester, England, Brussels, Belgium and Paris were made of silver plated letters, as also the legends "Eight Years' Test" and "You Light a Match, the Heater Does the Rest." The Douglas No. 2 and No. 3 water heaters were shown in planished copper and a nickel plated Sectional No. 2 was on exhibition to show the operation. Three new heaters were shown for the first time under the name Acme. The No. 9 is adapted for boiling water, and is fitted with a shower and thermometer when required. The No. 7 is adapted for bar and restaurant use. The No. 6 is made for doctors, dentists and barbers. All of the Acme heaters are designed for connection with the water service pipe of a building. The Perfect gas controller, in scarlet paint and gilt lettering, made by the Brownhill Company, Chicago, was shown in connection with this exhibit. It is designed to automatically control excessive pressure, and testimonials in the circular speak of a saving of 15 to 40 per cent. in gas bills.

THE AMERICAN RADIATOR COMPANY, Chicago, were well represented by Clarence Wooley, who recently returned from a visit among the trade abroad, and he speaks highly of the reception given him. He was assisted by Sam Hopper, Charley Foster, S. K. Pitman, Clarence Carpenter, Ed. W. Sumner and John B. Dyar. The new Detroit flue radiator was the center of attraction, and is a handsome sample of the Renaissance style of ornamentation. It rested on their latest window radiator, and was surrounded by the plain fluted National, Detroit, Detroit direct-indirect Ideal and Perfection radiators. They were decorated in rose, olive, oxidized silver, chocolate, copper and gilt with the relief portions in tints.

THE KNIGHTS OF TABASCO were everywhere at the right time and are very popular. President Finnerty said their good fellowship entitled them to the right of the line in the parade, but with becoming modesty they brought up the rear, carrying umbrellas with red ribbon streaming from the ferrule, and marched with precision to the music of their band, led by Old Pepper T. J. Cushing, and marshaled by the other Peppers. They went through a very pleasing drill in opening and closing the umbrellas and keeping time to the music with them.

NICK SPANG detected an old plumber's helper that he knew, and invited to join him in guarding the rear of the Knights of Tabasco as they marched.

LOUIS W. GAY, one of the "Peppers," is an engineers' supply man from Buffalo.

GEO. L. BOTTUM, the general agent of the John Douglas Company and the Lausten Lead Works, Chicago, is both "hot stuff" and an all around plumbers' supply man.

CHARLES S. SIDDONS, Buffalo, N. Y., representing the Buick & Sherwood Mfg. Company, Detroit, and their Success tanks and seats, says he is lost in Detroit, the East being his field. Little Charley is one of the "hot stuffs."

OLD PEPPER T. F. CUSHING, representing the John Simmons Company, New York, pipe fittings and brass goods, took T. J. Cusack, a Kingston, N. Y., plumber, out for a drive to see the city.

G. W. YOUNG of the Standard Mfg. Company, Pittsburgh, Pa., dropped enameled baths and plumbers' goods and worked for the Knights of Tabasco

THIS was the first opportunity for the Western salesmen to join the Knights of Tabasco, and 100 new members shows its popularity.

E. F. ACKARD, treasurer of the Saginaw Hardware Company, was a delegate from Saginaw and envies a Knight of Tabasco his honor.

THE KNIGHTS of TABASCO, led by A. E. Hyde, entertained all on the moonlight excursion by their vocal music. The boys are use to telling sweet stories in perfect harmony.

THE PORTERS at the Cadillac were told to watch for any one that had two pairs of shoes on, as one prominent Connecticut plumber lost his, which seems rather strange, too.

THE RICHMOND STOVE COMPANY, Norwich, Conn., were well represented by Thomas J. Douglas, a Tabasco Knight, who made an occasional remark on Richmond Sectional and Victor steam and hot water goods.

"JIM" SMITH was the way he was known to the Tabascos, but to the trade he represents the A. Harvey's Sons Mfg. Company, Detroit, steam, gas and plumbing goods and heating apparatus.

T. F. KELLY of the L. Wolff Mfg. Company, Chicago, is a good dancer, and as popular with the ladies as he and his line of goods are with the plumbers. He is so genial that without his badge he would not be known as "hot stuff."

JOS. E. LEE, who assisted the ladies' entertaining committees, drove the writer around among the hotels to see the ladies.

who had arrived, in order to make proper arrangements for their amusement. The work is better than either plumbing or newspaper work.

A HORSE CHESTNUT suspended from a red ribbon was a unique reminder of the presence of the Buckeye State plumbers.

WHEN the parade passed the office of the Cleveland Faucet Company their front was filled with their people, who cheered a welcome.

"HAHNE & Co., Steam and Hot Water Heating," was what the lettering on the show windows said, but a fine display of modern plumbing fixtures was what appeared as the parade passed.

"ALL TO THE FRONT" must have been the order when the parade passed the headquarters of the James B. Tufts Company, Boston, for their door was filled and a merry welcome shouted.

ALLEN BLACK came alone to represent St. Paul, Minn., and if the plumbers at home knew of the reception that awaited him he would have had plenty of company.

JOHN A. KRAMER, 912 North Third street, Harrisburg, Pa., makes a specialty of steam and hot water heating in addition to plumbing.

ALEXANDER DON, Newark, N. J., is a steam and hot water heating man who can show a number of successful jobs in fine residences.

C. H. KRANICHFELD of the New York City delegation, though from the neighborhood of the late "Mother" Mandlebaum, Rivington street, is a sound theologian, as John Michell's partner, friend McMein, can testify.

AS HAPPY a gentleman as attended the convention was Geo. P. Kirtley of Kirtley Bros., sanitary and contracting engineers, Kansas City, Mo.

THE TRADE-MARK of the Kennedy Valve Mfg. Company, New York, in red ink, adorned the card presented by Charles P. F. Cushing, who can talk business in a very entertaining manner.

J. N. GLAUBER and ALEX. M. BUCHMAN represented the Glauber Brass Mfg. Company, Cleveland, Ohio, and they did not "stop and waste" any time, but were alive to all that was transpiring. They had a large sign hung across the entrance to the exhibitors' room showing a picture of a Glauber stop and waste with the name of the company, their specialities and words of welcome.

THE A. A. GRIFFING IRON COMPANY, Jersey City, N. J., could have no more acceptable representatives at a convention than their Western manager, Frank E. Somers, and M. H. Houghtaling from the Chicago house. The Bundy radiators will not be forgotten or held in low esteem after meeting them.

THAT GOOD GOODS come in small packages is true, as any delegate can testify of J. K. Finney, who represents ably the L. M. Rumsey Mfg. Company of St. Louis. His manners are like the brass goods of his house, highly polished and the genuine article.

"SANITARY SPECIALTIES, Brass Pumps and Plumbers' Supplies Manufactured by the Henry Huber Company, New York," was on the cards presented to every delegate by John Emig.

D. T. RODGER of 11 Lafayette avenue, Detroit, makes a specialty of steam and hot water heating in addition to plumbing.

A. B. PIERCE was greeted on every side by friends who know him and the line of plumbers' brass goods made by his house, the N. O. Nelson Mfg. Company of St. Louis.

CHAS. I. HOBKIRK talked the improved Rider and Ericsson hot air pumping engine in the interest of Delamater Iron Works, 87 South Fifth avenue, New York.

JOHN HICKMAN, President of the Paterson, N. J., association, and Samuel L. Malcolmson of the New York delegation, visited the Order of Chosen Friends and made speeches.

BERTRAM represented Wichita, Kan., and thoroughly enjoyed meeting plumbers from all over the country.

PRESIDENT HENRY P. COPE and J. E. ZIMMERMAN of the Ideal Mfg. Company, Detroit, whose trade-mark is a triangle with their name in it amid a cloud and with rays shooting from it, distributed "A reserved seat at the Cadillac." It was a little book devoted to their Ideal seats. The card they presented spoke of the Ideal lines of seats, tanks, valves, hose reels, iron toys and novelties.

N. HAAS of West Bay City was proud of belonging to the first association formed in the State of Michigan.

IN THE MATTER of badges the delegates to this convention had endeavored to outshine any of their previous efforts, and they succeeded admirably. Much originality was displayed in designs, and many were exceedingly artistic, worthy of being preserved as souvenirs of the occasion.

THE Chicago delegation traveled in its own train to Detroit, by way of the Wabash Railroad. The special left Chicago at 10.25 on Monday morning and arrived at its destination at 5.10 in the afternoon, making a remarkably quick run. The delegation was a large one and was swelled by considerable additions from other parts of Illinois and States further west, as well as a goodly number of ladies. Plenty of room had been provided, however, and the trip was made exceedingly pleasant by the unremitting attentions of the railroad officials, supplemented by the watchful care of the Committee of Arrangements of the Chicago Master Plumbers' Association. The rapidity of this journey would nevertheless have been an unpleasant feature if it had not been for the very smooth roadbed and well kept rolling stock of the Wabash Railroad.

TREASURER W. E. GOODMAN when presented to President Elias Berla and Secretary Alexander Don of Newark, N. J., and President John Hickman and Levi McBride of Paterson, N. J., said: "I am glad to meet representatives of a good State, and expect to hear of increasing associations with such men to work for the cause."

THE FOLLOWING letter was inclosed in an envelope with a neat calf bound memorandum book, having celluloid mosaics showing cuts of the gas machine and the hot water heater made by the Detroit Heating & Lighting Company: "Extending to you, as one of the delegates to the twelfth annual convention of the National Master Plumbers' Association, our best wishes, we herewith inclose a slight memento, which we trust will serve in the future as a pleasant reminder of your visit to the beautiful little 'City of the Straits.' We trust that the first memorandum entered in the book will be the date upon which you will favor our factory with a call during your stay here. We can assure you your call will be appreciated, and you will find us at home."

A HANDSOME vest pocket memorandum book was distributed among the delegates with the compliments of the Maryland Pottery Company, Baltimore, Md. Their trade mark, composed of their name and address and the word "Heath" used four times arranged as a diamond around their monogram with the words "Vitreous China" beneath, was printed in a tinted ink in the middle of each page. At the top and bottom of the page in red ink brief sentences extolled the merit of their sanitary vitreous china goods. They also distributed a little book on the qualities and defects of sanitary earthenware and the superiority of vitreous china. Secretary M. J. Brown, Jr., and John H. D. Rowan were in charge of their exhibit of front and back washout and siphon closets, plain and decorated, with and without vent and right and left hand, lavatories round and oval and urinals. Vitreous china is claimed to be a hard, vitrified, non-absorbent material, impervious to all deleterious matter, that positively will not craze or fall to pieces from "wet rot." In the manufacture a temperature is carried that is said to be 50 per cent. higher than is required with ordinary ware, and the goods are fired for more than twice the usual time in order to endow them with the superiority that is claimed for them.

WM PALMER, representing the American Tube Works, Boston, Mass., distributed a catalogue giving a list of sizes, weights and strengths of seamless drawn brass pipe for plumbers among the delegates. It contained the names of prominent plumbers who have used the pipe and the buildings where it is used. The delegates say that brass pipe is coming into more general use.

THE MASTER PLUMBERS OF WORCESTER, Mass., value membership in their association at a good stiff figure. Their initiation fee is $250. They report that they have consequently received only good material in their local association, the interest taken in its proceedings being so intense that they very seldom have any absentees from the regular meetings.

FRANK DU BOIS, representing Du Bois & Darrow, the newest plumbers' supply house in New York, visited some of the manufacturers in the city whose goods they are the Eastern agents for.

W. B HUBBARD, representing Peck Bros. Company, New Haven, Conn., and his wife were the guests of the delegation from Boston and vicinity.

A REPRESENTATIVE of the Oster Mfg. Company, Cleveland, distributed circulars of their patent adjustable die stock, which does not need to be unscrewed to remove after the thread is cut on the pipe.

MARK E. MONASK represented the Van Auken Steam Specialty Company, Chicago, and all the delegates received his card.

THE PERSUASIVE ELOQUENCE of John Mitchell of New York was never heard to better advantage than on Tuesday afternoon, when he championed the cause of the delegates from the State Association of Michigan. In polished phrase and with fine oratorical effect he pleaded for the larger representation for Michigan, and if the way had been clear would no doubt have carried his point with ease. But the law, as laid down in the constitution, prescribed a different course for the association and his magnificent effort was put forth to no effect.

THE EXCURSION on the Detroit River on Tuesday evening was a very enjoyable event. The pleasure steamer "Promise" was crowded with plumbers and their friends, their wives and their sweethearts. A large dancing floor formed part of the steamer's accommodations and it proved a constant attraction to the excursionists. The weather was apparently made to order for the occasion and could not have been better. The fine harbor and the exquisite panorama of the water front along Detroit and Windsor excited the enthusiasm of the visitors.

A VERY ACCEPTABLE SOUVENIR was distributed by the Mount Heater Company of Detroit. It was a hard rubber paper cutter and envelope opener of just the shape and pattern to do the work satisfactorily. The company also presented the members of the convention with copies of their latest catalogue, a handsome publication of 36 pages, devoted solely to hot water heating. The several styles of heaters made by this company are illustrated in sectional and perspective cuts, and their special points of merit are fully set forth.

JOHN B. SMITH, Lewiston, Maine, sported a cane presented at the Water Works Convention, at Boston last week, by the Ross Valve Company, Troy. The handle was an aluminum valve.

THE "CLEAN SWEEP MAN" was the way A. C. Cogswell was generally known. He represented the Detroit Sanitary Supply Company, Detroit, makers of the Clean

Sweep non-siphon sewer gas trap and sanitary specialties.

FRED. J. STROEBEL, representing the Royal line of steam and hot water boilers and hot air furnaces, made by Hart & Crouse, Utica, N. Y., was at home among the plumbers. He put both steam and hot water catalogues on every seat at the convention hall on Wednesday and they received no little attention.

THE SIOUX CITY, IOWA, delegation wore a pin to hold their badges representing a hog resting on an ear of corn as emblematic of one of the industries of the Hawkeye State.

"WHAT CONGRESS HAS DONE," was a book of empty pages given by the Niagara Radiator Company, Buffalo, N. Y., written by their manager and distributed by Frank C. Perew and F. G. Haywood.

C. BIRKERY of the Birkery Mfg. Company, Hartford, Conn., and O. H. Jones distributed a very neat vest pocket match case showing a cut of the Birkery ball cock, under which was "There is no match for the Birkery."

JOHN L. E. FIRMIN, San Francisco., Cal., is one of the well known men at the conventions. He was with bachelor John Crimmins of Los Angeles, Cal.

"IT LOOKS IMPOSSIBLE BUT IT CAN BE DONE," caused a search for the coins to be passed through the hole in a cardboard problem given out by the Herendeen Mfg. Company, Geneva, N. Y., which also spoke of the Faultless Furman boilers.

"GOOD CENTS AND DOLLARS buy the Dunning boilers for steam and hot water heating, made by the New York Central Iron Works Company, Geneva, N. Y.," was on a neat coin purse distributed by C. H. Williams, who was everywhere that the plumbers went and always genial.

M. A. DUNNING was one of the delegates of the Northwestern M. P. A. who is a hardwareman and a heating engineer as well as a sanitary specialist.

MISS JENNIE H. MIDDLEBROOK, daughter of Major Middlebrook of Bridgeport, Conn., was the designer of the badge worn by that delegation, and "handsome is as handsome does" is indisputable in this case. She enjoys the distinction of being the only woman to hold office in her city, being the assistant town clerk.

MASTER WILLIE WATTS, Louisville, Ky., was the youngest plumber at the convention.

TUESDAY AFTERNOON the ladies were surprised by a fine lunch provided by the Buick & Sherwood Mfg. Company of the city of Belle Isle, where the group was photographed and the ladies left their addresses so that a copy could be sent to them. This was a very pleasing feature of the drive.

C. H. KALVELAGE, representing the Hoffman & Billings Mfg. Company, Milwaukee left plumbers' and steam fitters' supply talk at home and enjoyed the geniality that was a feature of the convention.

S. RESEK, representing the Farnan Brass Works, Cleveland, Ohio, was always in sight when either fun or business was going on.

A. E. SMITH, representing the Vulcan Company of New York, showed their gasoline torch and as a result sold a large number, and circulars of it were in demand.

J. P. NEWERBERG of Reich & Neuer berg, 862 North Halsted street, Chicago, was one of the active representatives of the fraternity.

JOSEPH NEIL, West Superior, Wis., said that the warmth of the greetings at every hand reminded him of good solder at the right heat for wiping.

THERE were few strangers to H. S. Van Volkenburgh, who did not let the interests of the improved Bolton hot water heater suffer, as the Nashville Machine Company, Nashville, Tenn., will appreciate later.

JOSEPH RICE, 653 Third avenue, Pittsburgh, was shown the points of interest in the city by J. B. Lawler, a Detroit journeyman plumber who learned his trade in Pittsburgh.

JAMES W. PARTLAND, East Congress street, Detroit, has recently completed a very handsome sample room with marble trimmings and has lavatories, baths, water closets, sinks and laundry tubs set up in the best of style and was just finishing the lettering on a very handsome sign in colors and gilt on his plate glass show windows in honor of the convention.

FRANK WALSH, 45 West Congress street, Detroit, made a fine show of plumbing goods in his window and set an example worthy of being followed in having blooming plants and vines arranged to relieve the effect. He may not be to blame for it, as he is quite a horse lover and a young lady presides over the office, another worthy example. A drive with Mr. Walsh is very pleasant.

JAMES F. TRAYNOR of Wilmington was the sole representative from Delaware, but the blue hen's chicken can scratch for the brood. He does steam and hot water heating and has a $20,000 contract on hand.

THE NIAGARA RADIATOR COMPANY, Buffalo, N. Y., displayed four of the Niagara radiators on a Persian rug. These radiators are of the rococco design and were of different hights and ornamented with silver and gold bronze on green, brown, olive and cream colored grounds. These radiators are all prime surface and are of the flue construction with ample air space. The waterways are designed to facilitate circulation and the end sections being solid they present a neat appearance. The central sections are of the three-column style. They attracted many observers, and their merits were explained by Secretary Perew and F. G. Heywood, the Western manager, who came over from Chicago to meet his old friends.

JOHN HICKMAN, president of the Paterson, N. J., Master Plumbers' Association, showed the "G. & V." plumbers' pipe clamp made by Gardenier & Vermenlen of his city, and distributed circulars showing their use and advantages. The helper don't have to hunt for bricks to hold the pipe or brass work when a set of these clamps are in the tool bag.

T. H. HUZE and V. M. WELLMAN just suggested that sanitary specialties could be had by applying to the C. F. Hunger Company, Cleveland, Ohio.

THE DAVIS HOT WATER COMPANY, Racine, Wis., put a circular of the gas hot water heater for domestic use on every chair in the convention hall.

T. F. CASSIDY, inventor of the Champion clamp machine, sold by C. A. Bray, Boston, Mass., showed how straps for 68 sizes of lead pipe could be made from brass strips with this machine cheaper than tacks could be used. Continuous straps, hangers and washers for marble work can be made quickly.

OVER 600 patent Magic basin clamps were distributed by the Glauber Mfg. Company, Cleveland. They will fit any basin, and having a brass spring hold it tight and do not break the pottery.

AT THE Ben Hur farm a Philadelphia hopper closet is used for a flower pot, and nevertheless fragrancy is one of its features. It is mounted on a tree stump.

J. H. MUELLER let the delegates know that the Crane Company, Chicago, ranked in front as a plumbers' supply house.

NEW JERSEY was ably represented by her delegation, and much interest was taken in an impromptu meeting held by them at the Hotel Cadillac with the view to forming a State delegation. The national officers expressed their willingness to lend any assistance possible to this end. Alexander Don of Newark and John Hickman of Paterson can furnish information as to the plan of proceeding, and it is hoped that sufficient interest will be taken by those who do plumbing work to warrant the call of the craft at some point on the seashore in the near future.

IF ANYBODY'S JOB has not been properly done it is because our helper did not have his pads and joints ready for use.

A Solid Delegation.

New York City sent her full complement of 37 delegates to the convention of the National Association of Master Plumbers at Detroit and they were accompanied by the Paterson, N. J., and the Bridgeport, Conn., delegates. The ladies with the party were Mrs. Yule, Mrs. Cameron, Mrs. Blace, Mrs. Delacy, Mrs. Pattison, Mrs. Mitchell, Mrs. Rossman and Miss Byrn of New York, Mrs. Green, Miss Green and Miss Middlebrook of Bridgeport, Conn., and Mrs. Page of Naugatuck, Conn. Through the untiring efforts of John Yule two cars were chartered and ample refreshments were provided for the journey. Mr. Yule made his arrangement with the West Shore Railroad and induced Chas. S. Andrews, the passenger agent for the West Shore route, to travel with the delegation and look after their comfort. As a result Mr. Andrews selected his stopping places and arranged for inviting repasts with ample time for their enjoyment.

A floral horseshoe made of sweet peas, with the letter "P" made of pinks, surrounded by white tuberoses, was sent the delegation with the best wishes of the Henry McShane Mfg. Company, 624 Sixth avenue, New York. In addition they presented each of the travelers with an individual souvenir "Wishing you a safe passage" that met with a merry reception. Mr. Andrews arranged for stopping over at Niagara Falls for a later train and the privilege was accepted by several of the ladies and their escorts.

Hotel Cadillac was reached after a day amid beautiful scenery and a ride for some miles along the lake. After a little delay owing to the demand for rooms all were comfortably quartered and later presented a refreshed appearance in the beautiful dining room of the hotel for tea.

The Knights of Tabasco.

The meeting of the Knights of Tabasco was called to order on Monday night by D. M. Davidson, "Young Pepper," in the absence of Old Pepper T. F. Cushing, who later assumed the chair and made an address on the objects of the association that was to the point and brief, but courteous. The applications of 49 new members were received and the president announced their election with the remark that they would be initiated into the mysteries of the society later.

The following elect are on the anxious bench wondering how "hot" the "stuff" that is to be applied to them will be: Samuel Clark, Thomas J. Douglas, A. C. Cogswell, J. H. Davis, G. F. Hickmott, J. A. Rathbone, C. A. Miller, J. A. Smith, Nicholas Spang, C. J. Johnston, William Palmer, J. E. Zimmerman, G. L. Bottum, C. H. Muchenhirn, M. J. Cohen, P. E. MacDonald, E. D. Babcock, W. H. Hayes, R. M. Dorsey, C. Cushing, D. D. Brick, J. K. Soultz, W. B. Hubbard, John H. D. Rowan, M. J. Brown, Jr., R. Rom, S. E. Little, G. Young, A. M. Buchman, W.

H. Castlen, F. W. Somers, A. E. Hyde, Henry P. Cope, W. H. Morse, J. E. McClain, James F. Meager, H. B. Houghtaling, M. T. Whitney, Chas. A. Crique, F. B. Haywood, J. E. Holland, Fred. Holme, W. Emil Kugeman, R. M. Hooker, G. W. Cope, Frank K. Claw, G. W. Benson, H. B. Auger, M. Sullivan and Augustus Holmes.

On motion the Knights accepted the position in the line assigned them in the master plumbers' parade. On motion all were ordered to carry umbrellas with red ribbon streamers. "Old Pepper" stated that a band had been hired for the occasion and the knights adjourned to meet at 8.30 a.m. Tuesday.

Second Meeting of the Knights.

Word was sent along the line to assemble in the parlor for the initiation at 1.30 p.m., Wednesday, and a full attendance was the result. The Knights passed through the ordeal of initiation in the presence of the other candidates, as it was impossible to handle so large a body, there being 59 new members enrolled up to date.

The candidates were selected, and the initiation would make interesting reading, but it is the only good thing that a salesman has which he does not share generally with his trade, consequently the mystery must be preserved.

On opening the meeting the roll was called. "Young Pepper" then addressed "Old Pepper," and read a communication from the National Association of Master Plumbers, which said that a long session would prevent them from escorting their ladies to excursion steamer to the Ben Hur farm, and requested that the Knights of Tabasco perform that duty for them, which was greeted with cheers. On motion the initiation ceremonies were dispensed with in order to comply with the request.

"Old Pepper" appointed G. W. Young, E. G. Pond, J. E. Zimmerman, D. M. Davids, T. F. Cushing and C. H. Muchenhirn as chairmen to select their own committees and to wait upon the ladies at the Russell, Ste. Claire, Wayne, Normandie, Cadillac and Barclay hotels. The meeting adjourned to meet at the call of the chair to proceed with the initiation ceremonies, and announced that the meeting would be called on the return from the excursion.

Tabasco Refrain.

Who stole my gold watch and chain?
You did.
Who brought it back to me again?
He did.
Who drank all my sparkling wine?
I did.
Who showed the very finest line?
All did.
Who on bard work seemed to thrive?
They did.
Who ever saw men more alive?
I did! You did? No! he did!
Who did? The man who died because he did.

The Ladies.

This year was notable for the attendance of the ladies and the most elaborate floral decorations lost their sweetness and beauty by comparion.

New York was represented by Mrs. Mitchell, Yale, Blace, Cameron, Delacy, Rossman, Pattison, and Miss Byrns.

Chicago by Mrs. Redieske, Breyer, Culloton, Boland, Doyle, Boyd, Sanders, Herbert, Mandable, Conway, Deveney, Cummins, Hickey, Murphy, Wade and Verity.

St. Louis by Mrs. Sheehan, Lonergan, Quinn, Carrol, and Misses Madden and Crim.

Pittsburgh by Mrs. Gray, McCullough, Blythe, Addy, Cowling, McKnight, Bradshaw, and Misses Alice Pitfield, Annie McKenna and Kittie McKenna.

Louisville by Mrs. Duffy, Watts, Ramsey, Matlack, Shulhafer, and Miss Bessie Shulhafer.

Buffalo by Mrs. Stygal, Mensch and Yohl.

Boston, Mrs. Hartnett, Smith.

Lewiston, Maine, Mrs. Smith.

Harrisburg, Pa., Mrs. Kramer.

Saginaw, Mich, Mrs. Merrill.

Brooklyn by Mrs. MacDonald, Lewis, and Miss Lewis.

Naugatuck, Conn., Mrs. Page.

Bridgeport, Conn., Mrs. Green, and Misses Green and Middlebrook.

The Reception Committee of the Detroit ladies, with Mrs. Comstock for president, was composed of the following: Hotel Cadillac, Mrs. Toll, Kramer, Gulney, and Misses Gulney, Crumley, Sheehey, Leunane, Hull, Burton, and Geo. W. Dennis and Melvin Elliott; Russell House, Mrs. Reid and Burton, and Misses Steiner, Walsh and Lee, and Joseph Doyle and David Reid; Hotel St. Claire, Mrs. Walsh and Drury, and Misses Frumvieller, Kramer, Halloran, Hatzenbauler, Giefel and Larkins and Joe E Lee and Harry Wyman; Hotel Normandie, Mrs. Barbier and Bolt, and Misses Meathe, Kramer and Gulney, and James Cameron and Geo. Williams; Hotel Wayne, Mrs. McFadden, and Misses Meathe, Steiner and Cullen, and A. W. Barbier and A. D. Babcock. The Miscellaneous Committee was Mrs. Kenealey, Morris and Sullivan, and Misses McKerchey, Nilla, McKay and Maber.

On Tuesday at 2 p.m. the ladies were taken on a drive to Belle Island and a moonlight ride on the river in the evening. On Wednesday at 4 p.m. to a supper at the "Ben Hur" farm at Walkerville. On Thursday afternoon a carriage ride. Friday 8 a.m., an excursion up the river and a fish dinner at the Oakland House.

Organization.*

BY J. SHEEHAN.

In presenting this paper I beg your indulgence in reiterating our experience as a master plumbers' association, and offering a few suggestions on the subject of "The best plan for the organization of master plumbers' associations and the proper limit of their action," as I know of no better way of making the subject clear than to speak from actual experience. It is a subject requiring much careful thought, inasmuch as it is to be criticized by you, and, if your judgment be favorable, to be referred to the constituent bodies of our national association that have organized and are enjoying the resultant benefits of wise, conservative government, whose opinions and experiences regarding the proper scope of associated effort may differ from ours, and also go before those master plumbers who have not united in inaugurating needed reforms. To the latter this essay is respectfully submitted, and should a review of our experiences and hopes be the means of awakening a consciousness of their responsibility by pointing out lost advantages and gains to be secured through organization, the writer will feel amply rewarded.

OBJECTS OF ORGANIZATION.

The discouraging condition of the plumbing business previous to the inception of our organization actuated us to form ourselves into an association in order to correct existing abuses, maintain our rights as honorable craftsmen, elevate our vocation to a point where from mere struggling mechanics we should be professional sanitarians, and by reason of our ability win the confidence of the public. The motive of the association is to unite upon a comprehensive plan, as many as possible, for a threefold purpose: 1, of obtaining the wisest judgment; 2, the greatest strength, and, 3, the most complete uniformity of action; and in our associated efforts we have been most successful. We have convinced our patrons that we are not the "awful plumber" whom the newspaper scribes take such delight in illustrating and writing about. Our methods are honorable and our bills fair, as they should be for good work, and are only commensurate with our efforts and the time we have spent in perfecting ourselves in the art of protecting the health of the people We have also convinced manufacturers and jobbers of the correlation of our interests, and the journeymen that our interests and theirs are so closely allied that we cannot afford to be inimical in our relations.

MEMBERSHIP.

Who are eligible to membership? At the inception of the association we desired strength in numbers as well as quality of members; but we, the St. Louis Association, have now become strong enough to name the qualifications for membership. Twelve years ago the required qualifications for master plumbers were not necessarily as rigid as to-day, for we have made great advances in sanitation and many new and complicated appliances are now on the market, making it necessary that the progressive master plumber should have a more extended knowledge. In launching our association we found it necessary to open wide the door and extend a pressing invitation to every master plumber to unite with us in elevating and protecting the trade. In so doing we admitted aspirants whose credulity and ignorance led them to believe in the alleged plumber's profits, and that there was no easier road to wealth than by the plumbing business. But, alas! for their mistaken ideas. How they would have fared had it not been for the fostering care of the association they can attest. We realized the existence of poor workmen; that they were in the business with money invested, not much, perhaps, and that the best and only way to eradicate the evil was to educate them by example and contact. That we met with difficulties at the outset is evident, but we have demonstrated its feasibility to a sufficient extent to warrant us in recommending to associations that wish to perfect further the conditions of the business not to be too loud in condemning the practices of their neighboring craftsmen who may, by reason of their lack of favorably located and well stocked stores, gain the ear of the public and elicit sympathy in their favor, but rather educate and encourage them to more honorable methods. Well directed effort in this direction will in time eradicate poor work and do away with the disagreeable and dishonorable competition with cheap labor and poor work, for they generally go hand in hand. The success of this alone will more than pay for the time spent in its interest.

INVITATION TO MASTER PLUMBERS.

Master plumbers' associations are not formed for coercion or monopoly; therefore we should invite all worthy master plumbers to affiliate with us—that is, master plumbers who are conducting a creditable business. As it is the duty of every citizen to support the government which protects his life and property, so it is the duty of every master plumber to support the association that has his interests at heart. If a worthy journeyman plumber desires to start for himself, though he may have been in our employment and by leaving us become our competitor, we should lend him a helping hand. For were we not once journeymen plumbers? Encourage him to strict business methods; teach him to reason that a moderate amount of good work at fair prices is more profitable than much work taken where the stock is furnished at cost and delivered gratis, so that people will see your wagon around town, and labor underestimated and poorly performed in order to get out whole and that a desirable business cannot be built up in this way. This will make competition less harassing.

As to those in business who will not associate with us, rather than attempt to force them into the association or out of business (both being very annoying and generally impossible, and which cause the public to look upon us with suspicion), let us conduct our business and association affairs in such a manner as to make them ashamed of their position, and then the public will look upon them as unwilling to unite in honorable

* Essay presented at the Detroit convention of the National Association of Master Plumbers, June 19-21, 1894.

competition and lend their influence in the furtherance of sanitary legislation for the protection of public health.

SELECTION OF OFFICERS.

The first and all-important factor necessary at the formation to insure the successful working of the association is the selection of cool headed officers—but not so conservative as to be timid in standing up for principle. The officers should be those who are known to the public and to their colleagues as straightforward business men and leaders in the profession, for it is essential that the initial efforts should be espoused and advanced by the best men. It is not always necessary that they should be the old heads, as the saying is, for we have a young element equally well qualified and interested in the welfare of the craft. It is also important that the officers should by their example lead in the good work rather than follow in the rear, as if they were on the battle field; for our position may be likened to a battle field, as we have to combat public opinion, which is naturally hostile to associated effort on the part of workmen or employers, no matter how well directed the effort may be. Wise and dauntless generals command the respect of their followers and the admiration of the foe. After organization and selection of officers it is incumbent upon every member to give the officers their support, for unless they enjoy the confidence of the members, and *vice versa*, but little can be accomplished. It is also necessary that the members be true one to the other—that is, faithful to the rules adopted by the association, which, however, should not be too radical.

An association and its members should not start out with the idea that the conditions which they desire to modify and which have secured a foothold through many years of neglect can be substantially reformed in too short a time, for considerable labor must be devoted to pulling up the rank weeds which have attained unheeded such luxuriant growth.

An association is what the members make it. If the members are unmindful of their own interests and the duty they owe to their brethren and are apparently satisfied with struggling along, making no headway, or being dissatisfied, are unwilling to sacrifice as much to right the wrong as they are to grumble and quarrel, the association will be of little benefit. "United we stand, divided we fall," is a trite maxim which should not be lost sight of.

BENEFITS DERIVED.

To obtain the greatest possible benefit from organization you must enter into it with due regard for the rights of others; with a determination to be honorable in all your dealings; a willingness to sacrifice a little, if necessary, to maintain the principles of the organization. To do this your dealings must be of a nature to inspire confidence, for if it were not for the confidence existing in the business world, business would be paralyzed.

Cast aside petty jealousies. It is said that plumbers are suspiciously jealous of one another. This was true before organization and exists now to a certain extent. We read in one of our trade papers a beautiful illustration of the brotherly feeling existing between master plumbers today. In one of our Eastern cities a time-honored member was about to take his leave for a short visit to his native land, across the Atlantic, and his association tendered him a complimentary dinner on the eve of his departure, speaking words of love, wishing him *bon voyage* and safe return. Who ever heard of plumbers banqueting a brother plumber 12 years ago? If an association accomplished nothing more than to create such a friendly feeling it has done much. It is the true foundation and secret of success.

Members sometimes become lukewarm in attending meetings; sometimes because everything is going along nicely and nothing comes up to oppose them. If you do not attend, what assurance have you that some scheme is not being concocted which may be contrary to the best interests of the trade? Others become lukewarm because the association or some individual does not think exactly as they do. But did you ever stop to think that your association might be in the right and you in the wrong? Oh, no! Submit gracefully to the majority when the majority is right, which it is quite apt to be.

HOW TO INCREASE INTEREST.

To increase interest arrange for discussions on themes of interest to the trade. The association should be the means of disseminating valuable information relative to the best methods of doing work; proper sanitary laws. Information that Mr. Deadbeat, not many miles away, owes you for work performed last spring and that he needs to be watched, would be the means of saving considerable work and trouble, all for nothing. A good way to bring members out is to entice them with a light lunch and a smoke. A moderate collation is inexpensive and money well spent, for which each member may have an opportunity to receive his full share if he will only avail himself of the chance. Such meetings have not only a resulting monetary value, but a social value which should not be lost sight of when summing up the good of your association.

The object of joining so many members in one common purpose is to give power that could never result from the spasmodic action of individuals acting separately. This power should be utilized along the line of harmonizing relations and formulating desirable agreements with manufacturers and dealers in supplies relative to selling outside of the trade; promoting better relations with journeymen, and securing proper sanitary laws in the interest of public health.

METHODS OF BUSINESS.

That the master plumbers are justly entitled to the profits accruing from the material used is too well established to require comment. The dealers throughout the country, almost without exception, recognize that it is just to the plumber and beneficial to their interests as jobbers to deal exclusively with the trade. Did this idea of justice and protection originate with individuals acting unitedly? Hardly. It was through organization, without which all efforts would be futile. The jobbers, recognizing the justice of our position, also recognize that where no association exists the plumbers are apparently satisfied with existing conditions and act accordingly. If you are not satisfied, it only remains for you to do as we have done—organize and receive the most complete protection of any association in the country.

Do not presume that you can secure protection gratuitously; it ought not to be asked, and much less expected, that supply houses will protect you in the sale of goods unless you can offer some inducement in return, rather than compulsion. I regret that it is the prevailing custom among some master plumbers to substitute one manufacturer's goods for another's. I now refer to manufacturers who protect us. You figure on a job where a certain line of goods are called for, and, perhaps, secure the contract. You are a little partial to a certain manufacturer for various reasons. He may have befriended you some time and it is natural for you to do him a good turn, and which is very honorable if you can speak in behalf of his goods before any are specified; but after you have contracted to put in another manufacturer's goods and then go to the owner and say: "Smith's closets and tubs are very good, but Jones' are equally as good. I have used a great many of his goods and they have always given entire satisfaction, as I am sure they will in your case, and I will give you a good job. You see, I have been dealing with Jones for a number of years and of course I feel partial to his goods, not that they are any better, simply because he is an old friend of mine," perhaps the owner has not much preference and he consents. How would you feel toward a certain manufacturer who would say to a customer of yours who had called to see some goods: "Oh, yes! Barnes is your plumber—he is a fine fellow and a good workman, but did you get an estimate from Thompson? He lives up your way, too. He is an old schoolmate of mine. I had him do a little work for me last fall; his price was reasonable and his work very good, and they say he is doing a fine business." There is not much said, but considerable implied. Your customer may step in to see Thompson, whose prices are about the same, so he gives him the job. I do not wonder that manufacturers are sometimes out of patience on account of the uncalled-for treatment they receive. As master plumbers, we should do unto others as we would wish others to do unto us. Therefore, when a manufacturer who is protecting our interests and has influenced an owner or architect to use or specify his goods, it is as much your duty to put them in and keep still about your favorite manufacturer as it is for the manufacturer to show your customer his specialties and not speak of some other plumber.

MUTUAL PROTECTION.

As we are working for mutual protection we should be actuated by a spirit of fairness and generosity toward our neighbors. We should refuse, without the consent of the first plumber, to finish any work commenced by another plumber when he has been compelled to stop work from causes not his own fault, such as non-payment of installments as the work progresses or unreasonable demands on the part of the architects. An adherence to this rule will enable us better to assert our rights and secure prompt payment of money due us. When an owner, builder or architect presents a bill for work performed by another plumber, we should never question his prices, for you do not know the circumstances under which the plumber had to work. As a guide to members, a schedule of prices—fair, but not exorbitant—should be adopted. It will eradicate a discrepancy in prices and tend to restore the confidence of the public; for when one man goes to his plumber and then to another and finds the prices are about the same, he concludes that neither is outrageously large, as one sometimes appears to be under present existing conditions. We have found this method most satisfactory, not only to our members but to the public as well.

Master plumbers should not only be working plumbers, but merchant plumbers, and should stoutly refuse to use any material they do not furnish, and *vice versa*. A strict adherence to this system will tend to a better enforcement of the Baltimore resolutions and will create a better feeling between manufacturers and master plumbers.

It has been demonstrated by strikes and lockouts that one class of individuals cannot override or control another, and that better relations can be maintained and more peaceful settlement of disputes consummated by a conference between the parties interested than by refusing to amicably discuss and adjust grievances in question. We have found that a conference committee with our journeymen has been very beneficial. Hours of work and wages are arranged for a year in advance and other matters of importance to both parties have been adjusted. We have not reached perfection along this line, but our success warrants us in recommending conference committees between masters and journeymen.

In many localities it is optional as to how plumbing work shall be executed, and it is needless to say that in such places unsanitary work and disease prevail. Not alone is this injurious to the health of the community, but it renders it difficult for master plumbers who know how and have a desire to do good work to compete with the impractical plumber, who has but little regard for sanitation and whose chief aim is to make the most money out of the job

We believe, with New York and Massachusetts, that complete protection against this condition of affairs can only be obtained through legislation, and in that direction we are exerting our influence and trust that our efforts will be crowned with success.

Organization of Master Plumbers' Associations and the Proper Limit of Their Actions.*

BY S. E. DIBBLE.

Experience has shown that organization, as distinguished from individualism, is generally necessary to promote great interests. So long as organized bodies strive to only promote their interest in a legitimate way, do not trample on the rights of their individual members, or antagonize the welfare of the public, they will, as a rule, meet with the most hearty co-operation of all with whom they are concerned, provided their aims be proper ones; and such an aim, I believe to be the advancing of sanitary laws, the study of sanitary subjects and the promotion of sanitary interests generally. Therefore I say that master plumbers' associations, coming within the scope of this premise, are desirable and ought to be successful.

QUESTION OF ORGANIZATION.

There is no subject that is brought so near home to all of us master plumbers as this question of organization. Many essays have

*Essay presented at the Detroit Convention of the National Association of Master Plumbers, June 19-21, 1894.

been written on various topics, but none of more importance than this one. Organization is the material on which we have builded, and out of the strength which this union has developed has come a success greater than it was possible for the most sanguine and far sighted of us to expect.

The National Association, the State and the numerous local associations have not only of themselves been beneficial, but to the individual members has come the added benefit which has made them stronger, nobler and broader.

Of course pages might be written about associations existing only in name, of associations established but killed by intemperate enthusiasm, and of associations ruptured by discord, but the fact would still remain that the growth, strength and success of those that survive have come from organization.

The founders of these associations did not expect that formation was all that was necessary, but that formation having taken place, united action on the part of members should follow, and that aims having one common end should be pursued. With this in view, all practical master plumbers ought to associate together wherever feasible. Confidence in each other should above all be the aim and ambition of every member; next to promote and maintain and advance the principles of sanitary science through deliberations and harmonious action. Nothing should mar the proceedings of any meetings and all things should tend toward the elevation of the individual members. Each should impart to the others the knowledge he obtains in the prosecution of his trade, banish all selfish purposes and seek to promote the good of his fellow members in the organization, as well as his fellow men out of it.

DISSEMINATION OF KNOWLEDGE.

Men of advanced ideas are always found in every organized body. They lose nothing by imparting at the proper time and in the proper place the knowledge they have acquired or the ideas which they possess, be they theoretical or practical. Those men will still remain leaders, and they have nothing to fear from dividing their knowledge and ideas with others. Men will always be found who cannot put in practice what they know full well in theory, and to the practical man should be imparted that knowledge lest all be lost. With the desire on the part of the individual members to impart their knowledge comes the production and perfecting of many important devices whose application in a practical way is of manifold uses

Such action has often been and will be many times again the means of placing before the world many sanitary appliances adapted to the better protection of homes and families. Such results are bound to come from the united action of many and clearly show wherein our associations may be beneficial. All this, I am aware, calls for the sacrifice of self for the benefit of others. A very pretty sentiment, some of you may think, and yet it is much more than that, for by it comes much of the progress and advancement in the world.

Nor should a man confine himself to the limits of his organization. He should look at it from without if he would know how to make the most of it. He should see how others outside of it regard it; how it is received by them and what are its effects upon them. He should be able to detect its defects and remedy them, and these may be far more easily detected by looking at them from without than by viewing them always from within.

SUCCESSFUL ORGANIZATION.

Successful organization requires in the organizers a somewhat unusual combination of qualities, among which may be mentioned a knowledge of men and their ways, the faculty of looking ahead and seeing into things, and the faculty of clearly understanding and clearly presenting exactly the objects desired. While experience is useful, I do not think it is essential, and it is astonishing how soon a shrewd and careful man will make a success of his undertaking, even though his experience be limited. Perseverance against many disheartening conditions is a sure requisite.

It is a well-known fact that a piece of timber is no stronger than it is at its weakest point: that is, the point by which its ability to do its work must be measured. This general law holds good in all works and may be applied to all combinations of persons, and is certainly true of associations like ours. There must be union, there must be interest, there must be persistent effort on the part of each and every member to make the whole successful.

As to the proper limit of the actions of such associations, I should say, in a general way, that anything that tends to promote the welfare and the interest of the members without injury to any is proper and right. Among the first objects to be attained comes the education of the young men who have selected our particular trade for their life work, and upon whose efforts so much of the life and health of our people will in the future depend. This is an advancing age, and progress in sanitary science as well as in other branches of science is sure to be made. Our organizations should be educators. This may be brought about by debate, by discussion, by papers carefully prepared. I care not whether it be done by the larger or smaller associations, by the city or the country, all if properly done is sure to have an elevating and beneficial effect upon our young men.

In cities and towns where boards of health exist, the members of our associations should join with them in wise and useful legislation. Co-operation on the passage of laws and care in the exercise of those laws after they have been enacted should be the duty of us all. Such action would certainly result in promoting the healthfulness and cleanliness of our respective municipalities.

Within the proper limits of our action comes also co-operation with the manufacturers and dealers with whom we are in contact. Organization giving to all its members equal facilities cannot but be profitable to us and to all those requiring the benefit of our labors.

Practically no association is limited in its action so long as it directs its doings toward that which is honorable, and for the good of all; its work is never ended.

TRAPS AND VENTS.

H. C. BURNETT and R. M. BALDWIN have formed a partnership in a plumbing and gas and steam heating business at Bluefield, W. Va.

FRANK C. HOCK will open a plumbing and electrical wiring establishment in the Drake Block, Goshen, N. Y.

DENNIS SWEENY and W. B. BLOTTMAN will open a plumbing establishment at Greenville, Ohio.

MILLER & BISHOP, Scottdale, Pa., have added a plumbing department to their business.

OLDS & WHIPPLE of Hartford, Conn., have added sanitary plumbing to their already large steam and hot water heating busioes They have secured the services of B. O. Tilden of Boston to look after thia department.

SECRETARY CASE of the Water Board, Detroit, Mich., sent out notices last week to the 90 plumbers who had obtained licenses from him, saying that they should be examined by the Plumbing Board of the Board of Health before July 1, and get certificates from the latter. Quite a number have been examined by the Plumbing Board and half a dozen were unable to pass the necessary examination. These will be unable to work as master plumbers after July 1. At that date and thereafter every master plumber must show a certificate from the Board of Health.

The British Board of Trade returns for the month of May do not, says the *Economist*, give much encouragement to the theory that the trade of Great Britain is reviving, since there is a falling off on both sides of the account as compared with the corresponding month of last year. In imports the shrinkage amounted to $12,980,000, the falling off being most marked in textile materials. Exports were $1,622,400 less than in May last year.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THE CONTRACT for putting in the heating and ventilating apparatus at the Vermillion, S. D., University has been let to the B. F. Sturtevant Company of Chicago at $4400.

W. E. PAUL, Portsmouth, N. H., secured the contract for supplying the steam heating apparatus for the Saco Hotel, Saco, Maine.

THE CONTRACT for ventilating the Knapp School, Somerville, Mass., was awarded Braman, Dow & Co. of Boston, amount of bid being $1600.

THE CONTRACT for plumbing work on the city building and in the Fifth Ward engine house, New Castle, Pa., was let to W. B. Bagnall.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until July 6 for the steam heating and ventilating apparatus for the United States Post Office at Houghton, Maine. Drawings and specifications may be obtained from the Supervising Architect at Washington or from the superintendent at Houghton, Maine.

THE ARNOLD COMPANY have taken the contract for the hot water heating in W. R. Demarest's new house on Sherman avenue, New Haven, Conn. The same company have the steam heating of John Reichel's new house in Fair Haven, Conn.

ARCHITECT WM H. ALLEN has given the contract for the plumbing work in the new Seamen's Bethel, on Water street, New Haven, Conn., to the New Haven Heating & Plumbing Company. T. W. Corbett of New Haven has been awarded the heating contract.

WALKER & CAREY, East Main street, Waterbury, Conn., have taken the contract for the plumbing and tinning of the Connecticut World's Fair Building at West Haven, Conn.

SEALED PROPOSALS will be received by the president of the Board of Trustees, Milledgeville, Ga., until July 10 for work including the steam heating, plumbing, &c., in a new asylum building.

AT A RECENT MEETING of the Board of Supervisors it was decided to heat the court house at Champaign, Ill., jail and sheriff's residence by steam.

R. H. WALKER, Elmira, N. Y., was awarded the contract for heating the County Court House at Watkins for $2857.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until June 27 for labor and materials and fixing in place complete eight new hot water boilers in the United States Custom House and Post Office Building at St. Louis, Mo. Drawings and specifications may be obtained from the Supervising Architect, Washington, or from the superintendent at St. Louis.

CASWELL & MOORE, Phœnixville, Pa., have received the contract for the tinning and plumbing of a new block of houses to be erected by Mrs. Gillardon on Washington avenue in that town.

KEHM BROS. & MERTZ, 289 East Kinzie street, Chicago, are to install a hot water heating plant in the residence of

A. Von Tesmar, 233 Orchard street, and a steam heating plant in the McPherson School, Wolcott street, near Lawrence avenue, Ravenswood.

FLASHINGS.

Disley & Weyand, Waterbury, Conn., have a contract for the metal work on the new Methodist church in Derby, Conn.

The American Roofing Company, Cincinnati and St. Louis, report the shipment of something over 16 carloads iron and steel roofing to various points in the State of Texas during the month of May, while orders from various sections continue to come in very satisfactorily.

The Cambridge Roofing Company of Cambridge, Ohio, have recently purchased and now have in operation a modern outfit for the manufacture of galvanized eave trough and conductor pipe. Both are made in sections 10 feet long, without cross seam, and the large orders which have already been booked would indicate that their product in this line is fully up to standard, as is also their line of metal roofing and siding.

The Metal Stamping & Spinning Company of Grand Rapids, Mich., have issued a fine catalogue of their specialties for the season of 1894-95. It comprises 80 broad pages of illustrations of architectural ornaments and statuary, which are made by the company in sheet zinc, copper, brass and aluminum. These comprise capitals in numerous rich and original designs, rosettes, leaves, garlands and wreaths, points and drops, heads and faces, shells, angles and mansard leaves, panel ornaments and scrolls, enrichments for moldings and friezes, panel scrolls, gable ornaments, steel ceilings, creatings, finials, chimney tops, metal shingles, stamped sign figures and letters, rock face siding, bracket and modillion rolls, balls, &c. The company also manufacture copper, brass and tin ware. A feature of this catalogue is that prices are given in each case in immediate connection with the article. Another feature, still more noteworthy, is that the designs shown are largely original.

The Globe Iron Roofing & Corrugating Company, Cincinnati, with rolling mills at Newport, Ky., state that they did more business in roofing material during the month of May just past by at least 25 per cent. than the same period in 1893, the latter having been the banner month in the history of their business career. While orders are still continuing very satisfactorily, during a brief interval they were compelled to run both rolling mills and corrugating establishment night and day. They also congratulate themselves on the fact that since January 1 this year their mills have never been shut down or idle in any single department for any reason whatever, no breakages or repairs of any kind having been found necessary.

"What the People Say" is the title of a pretty pamphlet brought out by the Metallic Roofing Company of Canada, Limited, Toronto and Montreal, Canada. It is a book of general testimonials relating to their shingles, which include the Eastlake, Empire and Thorn's patent steel shingles. The first mentioned is illustrated as a frontispiece to the pamphlet. Attention is likewise directed to Hayes' patent steel lathing. The other shingles are shown at the back of the volume, together with tiles, rock faced steel siding, &c. The testimonials come from all parts of the Dominion and fill about 50 pages.

J. Foerster & Son of 806 East Fifth street, New York, have recently completed the copper work and slate roofing on the church at the corner of Oliver and Devoe streets, and the copper cornice, finials, ventilators, towers, skylights and slate roofing, including the galvanized iron ventilating pipe work, on the school house in Herkimer street near Ralph avenue, Brooklyn. The special feature of this job is that no iron whatever is used in connection with the copper work, the copper roofing being fastened with copper nails, while the gutter braces are of brass and the hinged leader fastener of copper nailed to the walls with ¼ x 3 copper nails. The lightning rod is also of copper fastened to the walls with brass staples made expressly for the purpose. The rivets are of copper and the bolts brass. Foerster & Son have also completed many other smaller contracts.

Shackleton Brothers have recently taken possession of new quarters at 171-175 Prospect street, Cleveland, Ohio, where with increased equipments, additional floor room and good light they are prepared to supply first-class work at low prices. They make a specialty of slate roofing, Hayes' skylights, steel ceiling (Kinnear's patent) and sheet metal work for buildings and other purposes. The slate yard of the firm is located on Cedar avenue in the city named.

The American Roofing Company, St. Louis and Cincinnati, report an excellent demand for corrugated iron. Some months since they added a new branch to their business, that of making gutters, eaves trough, conductor pipes, hangers, &c. This department has steadily grown and now requires a great deal of their attention. Their gutter catalogue, containing everything they make in this line, is being sent to the trade on application.

Recent Treasury Decisions.

Drawback on Tin Handles, Nozzle Bodies, and Caps Attached to Tin Cans.

On high tin handles made from imported IC tin plate, and on low screw tin nozzle bodies, and flat tin caps made from imported taggers tin, attached to 5 gallon tin cans manufactured and exported by the Standard Oil Company of New York, Sone & Fleming Works, a drawback will be allowed equal in amount to the duties paid on the quantities of imported materials used in the manufacture of such articles, less the legal deduction of 1 per cent.

The quantities so used may be determined by allowing 40 pounds of IC tin plate for each 1000 high tin handles, 10 pounds of taggers tin plate for each 1000 low screw tin nozzles, and 7 pounds of taggers tin plate for each 1000 flat tin caps.

Drawback on Steel Clock Spring Material.

On the exportation of steel clock spring material, rolled, tempered, polished and prepared for cutting into lengths suitable for clock springs, manufactured by R. H. Wolff & Co., Limited, of New York City, from imported steel wire rods, a drawback will be allowed equal in amount to the duty paid on the rods used in the manufacture, less the legal deduction of 1 per cent.

The quantity of imported rods so used shall be determined by adding to the net weight of the exported article, as certified by a United States weigher, 16 per cent. of such weight.

The drawback entry must specify the size of the clock spring steel material and the gross and net weight of each package to be exported, and the manufacturers' declaration on the entry must show that the article was manufactured in accordance with their sworn statement dated August 9, 1893.

Drawback on 1 and 2 Gallon "Round" Tin Oil Cans.

On the exportation of 1-gallon and 2-gallon "round" tin cans manufactured by the Standard Oil Company of New York at the Devoe Works a drawback will be allowed equal in amount to the duty paid on the quantities of imported pig tin and pig lead used in soldering such cans, less the legal deduction of 1 per cent.

The quantities of such tin and lead which may be taken as the basis for allowance of drawback shall be for 1-gallon cans 64 per cent., and for 2-gallon cans 73 per cent. of the allowance provided in the instructions of January 26, 1894 (Synopsis 14,592), for 5-gallon rectangular cans, subject to the special provisions and limitations of said instructions.

Hunting Knives—Certain Pocket Lock Knives Not.

Before the U. S. General Appraisers at New York, March 5, 1894. In the matter of the protests, 58,281 *a*-13,927, &c., of A. Kastor & Bro., *et al.*, against the decision of the Collector of Customs at New York as to the rate and amount of duties chargeable on certain pocket knives or lock knives imported per the vessels and at the dates named in the annexed schedule Opinion by Wilkinson, General Appraiser.

The goods are knives with horn or bone handles. Each has one large and one small blade; some of them have corkscrews, picks, &c., in the back, and all of them have lock springs to keep the large blade fixed when open, the knife being shut by pressure upon the small blade. The merchandise was assessed for duty under the provisions of paragraph 165, N. T., for pocket knives, and is claimed to be dutiable under the provisions of paragraph 167 for hunting knives. Paragraph 165 provides for "pocket knives of all kinds."

We find that the knives in question are designed to be carried in the pocket; that they are so commonly carried, and that they are in fact pocket knives.

The protests are overruled accordingly.

A peculiar feature of the transatlantic passenger traffic at the present time is that the larger tide of steerage travel is flowing eastward rather than westward, as is generally the case at this season. Outgoing steamers from New York are sailing with crowded steerages, while immigration is not up to the average. This is attributed to the existing business depression and comparative scarcity of employment in this country.

W. A. Stanton, secretary and treasurer of the Fayette Manufacturing Company, manufacturers of silica brick and magnesia, sailed on the "Campania" last week. He goes to the Continent to transact some business there.

At a fire in Dubuque, Iowa, last week, 22,000,000 feet of lumber were burnt up.

STEAM AND HOT WATER.

Convention of Master Fitters.

The Master Steam and Hot Water Fitters' Association of the United States began its sixth annual convention in a hall of the Broadway Central Hotel, New York, June 19.

TUESDAY MORNING.

The first session of the convention began at 11.20 o'clock President Rutzler in the chair. The roll call and reading of minutes having been dispensed with, by motion the president then appointed the following Credential Committee:

A. E. Kenrick, Boston.
E. D. Smith, New York.
C. H. Simmons, Chicago.
W. P. Thompson, Philadelphia.

After the appointment of the committee a recess was taken till 2 p.m.

TUESDAY AFTERNOON.

At 2.30 the delegates assembled, and the first order of business was the presentation of the president's address by Mr. Rutzler, extracts from which are given below:

President's Address.

I congratulate you on this, our sixth annual convention, that, after the financial and general commercial strain and universal lack of business covering the whole of the United States for the past year, there are enough of us left to make so fine a showing at this meeting. The position of the officers of the association for 1893-94 can perhaps be justly compared to that of men in the divers lines of business in our country, which is summed up in a few words of but little to do and an insufficiency of funds to do that little with.

Perhaps it is fortunate for me that my term of presidency should have fallen at a time when there has been so few demands upon us. To have accomplished so little in an ordinary year would be embarrassing indeed, but under the depressed circumstances through which our country has passed I am confident that you, as fair minded men, could not have expected very much. . . .

You are all familiar with the action taken at our last annual meeting in the matter of standard flanges, adopted as reported by our committee. Manufacturers have since suggested a few changes. This question was brought to the attention of the Executive Committee and myself, further mention of which will be made in the secretary's report.

Our Committee on Standard Flanges is still in existence. In my opinion this question should be referred to them again, that they may specially consider the changes recommended, perhaps in conjunction with a committee of manufacturers, or at least such manufacturers as are present or have representatives here. I am convinced that standard flanges is a long stride in the right direction in our interest and that of our patrons, and of the manufacturers as well. The ground of all these desirable features was so thoroughly covered in the discussion at our last convention that it is not necessary for me to bring them to your attention at this time any further than to say that letters received in answer to the pamphlets issued embodying the action showed a hearty approval on the part of the manufacturers.

It would be well, however, that we consider at this meeting what the percentage of inquiry by steam fitters has been for standard flanges, and how far they are endeavoring to use them in their work. You will remember that so far as was practicable we were to use in our business nothing but standard flanges after January 1 of the present year. One manufacturer, to my knowledge, has already made the necessary changes and is ready to supply the standards adopted. How extensively this has been done, or how many firms are thus equipped, is more than I have been advised of.

I am led to say that I never so fully realized the respect in which this association is held by the supply trade as I have since holding the position of president. I had always underrated our worth as an organization before, and I believe every member to-day who has not held office in it is undervaluing our strength. I think there are few, if any, manufacturers who are unwilling to extend to us what is our due. It is my opinion, too, that on account of the want of a full realization of how others look upon us, and with the uncertain value we place upon the organization ourselves, results are minimized and our effectiveness seriously impaired.

We have spent four years now, and I might say five, in trying to induce men who do a small amount of heating in connection with some other business to identify themselves with us and have our assistance in removing obstacles that are in their way. The question arises with me now, is it not better that we band together, as we should in the larger cities, and say we are going to take care of this association, leaving it with these outside parties to come with us if they want to, meeting them nine-tenths of the way when they offer to come, and do them all the good we can, but not hunt for them any more? Our lowest rate is $10 per year; it is barely possible that it might be made $5, but I do not believe if it were these men would do more than talk. They would rather keep that $5 than come into the association, and by some healthy method in the localities where they are doing business benefit themselves to the amount of $500. The National office has been filled with letters for the past two or three years wherein men state they cannot put a price upon their work because the consumer can get goods first hand.

I say this is purely the fault of men in localities where such transactions take place. I do not think they could do very much by themselves, but if they will join together and become members of this organization we can benefit them and stop such conditions. I know of one small city where all the letters we have had this year have been encouraging—not one complaint. They pay their dues promptly, and are acting in a fair and honest way toward each other. They originally simply sent out letters to the supply trade stating that they belonged to the national association, and I am confident they have had nothing to complain of in the way of violations. Their secretary writes that although they have not done one-third the work they did the year before, their profits have been greater.

There is another subject that I wish to call your attention to, and that is the contracting for work and guaranteeing a temperature of 70° Fahrenheit in zero weather. I think a committee should be appointed to recommend a remedy for this complication. . .

I call this matter to your attention believing that steps should be taken at once that will prevent any further encroachment upon our rights in this direction. We must not forget that we are nearly always the last contractors to complete our work, and if the party from whom we have taken our contract should run short of funds after he has paid all others, we have to wait until he gets good and ready to settle, with the possibility of losing the final payment or a portion of it entirely. We should not allow our anxiety to close a contract to lead us into accepting conditions that in many instances result in a loss on the work performed. Such contingencies can only be avoided through regulations and agreements among ourselves, through our local and national associations. The grievance cited here is one that I think our whole country is afflicted with, and therefore the special necessity of national action upon it.

For the honor which you conferred upon me at our last convention by electing me to the office of president I wish to earnestly thank you, and to attest that the duties have been pleasant as well as beneficial to me as a member.

At the close of the address, which was received with applause, Mr. Hudson moved that it be referred to the Executive Committee and the recommendations contained in it be reported upon Wednesday morning.

Before the presentation of the secretary's report, President Rutzler introduced David M. Nesbit of the London firm of Ashwell & Nesbit, heating and ventilating engineers, who later was to read a paper before the association. Mr. Nesbit spoke of the gratification it gave him to receive so warm a welcome. He referred to the excellent work he had seen in heating plants in New York and intimated that heating engineering was further advanced in this country than in England. Mr. Nesbit closed with a cordial invitation to any or all of the members to visit him should they ever go to England. Following this pleasant little episode Secretary Reynolds read

his report, of which we print part below:

Secretary's Report.

For the sixth time in the history of this association I place before you a review of a year's work, with a comment or two added.

As usual, the first few weeks were consumed in moving, installing ourselves in new headquarters and sending forth matter mapped out by the annual meeting. A mimeograph copy of the resolution of the Committee on Manufacturers and Jobbers was distributed very soon after our arrival in New York, as directed by the convention. This resolution you will remember reads as follows: "Your committee respectfully recommend that manufacturers and jobbers be requested not to sell goods to the consumer except to those who are already exempted by our former national consumers' discount sheet."

Pamphlets containing recommendation of the Committee on Standardization of Flanges and the action of the convention in the matter were printed at the earliest possible moment and placed in the hands of all steam fitters and manufacturers throughout the United States.

The letters called forth by this pamphlet were numerous, and were unanimous in the sentiment that the step was an important and well considered one from all points of view.

Some of the manufacturers were of the opinion that several of the dismeters recommended could be improved upon, and at the request of a few of them a call was issued for an executive committee meeting, and President Rutzler invited Carlton W. Nason, chairman of the Committee of Mechanical Engineers on standardization, to be present. A protracted session resulted, and it was the conclusion that the committee had better abide by the decision of the annual meeting, especially as the scale of standards had been placed in the hands of those concerned, leaving it with the manufacturers to come together and change such sizes as they deemed best. The matter was not again referred to until December, when we received a call from E. P. Bates, chairman of your Committee on Standardization. He stated that he had been requested to recommend the following alterations: "That the 3½ and 4 inch flanges be changed from four bolts to eight, the bolt holes being made ¼ inch in dismeter instead of ⅝."

The advisability of the committee's acting upon this was considered at length, and it was decided that they were not at liberty to do so, and thus the subject rests. . . .

LOCALS.

Reports from the various locals all through the year have not been very encoursging, but this is not surprising, taking into consideration the state of business generally and the limited amount of building undertaken in many localities.

TRAVELS.

As to my travels this year and my efforts to form new locals, I have very little comment to make. I have undertaken several short trips, but they have not been productive of much good, at least the results are not yet visible. There has been but little to warrant venturing the expense of traveling and seeking to increase our strength since our last annual meeting.

I was advised by one of our members that firms in New Haven, Conn., were anxious to come into the fold and do something for themselves. Upon this information I made a visit there, but could not succeed in getting them together at that time. I planned with one of the firms to arrange a meeting at a later day and advise me. This he undertook to do, but the report from him was that he did not meet with any success.

Two trips to Paterson, N. J, showed about the same results.

William P. Thompson of Philadelphia has been earnestly working the whole year to revive the local in that city and recently has been holding meetings with some promise of success. Mr. Thompson will be here to report what encouragement he has met with.

I have made four trips to Philadelphia since the headquarters have been in New York City, and I can assure you they are in something the same condition there that the city of Boston was in at the time of my first visit. All I can say is, if they were thoroughly organized with a view to making the situation as bad as possible it could not be any worse than it is.

On April 5 I started on a journey west. I first went to Cincinnati, where I think I accomplished some good; at least, we have recently received very favorable reports from there, which we hope will be verified at this meeting. From there I went to Chicago, where I found contracting employers of labor in all lines in a siege with their men, and there was no prospect of diverting the minds of our people from that issue. It is indeed a sorry day for organizations when Chicago men, with their experience, need any urging in association affairs.

Prior to leaving New York I had written St. Paul and Milwaukee inquiring if I could do any good by going there, and requesting them to reply to me at Chicago. Their answers were that they would be glad to see me, but they did not think I could be of any benefit. The one from St. Paul indicated that nothing could be done for them at the present time.

This is attributable largely to the financial condition of the country, there being really no prospect of work except perhaps to a limited extent. The letters from Milwaukee set forth that their local was in good condition, with an increased membership, but had not a very flattering prospect of business, and they urged for lower dues, &c., which they have since reduced.

From Chicago I went to St. Louis, where the men for a long term of years have failed to accomplish very much toward sustaining each other or their business as a whole. I could not remain there longer than two days, and I think from reports since my return that I did them some permanent good.

From St. Louis I visited Cleveland, where I found a grievance that was slightly unique. I will explain this in private conversation only. I did what I could during my short stay there to convince those I saw that the division existing between them was destructive in the extreme. We have late information that they have reorganized on somewhat new lines and that they will be represented at this meeting. Certainly this is encouraging, and we hope they will be here to speak for themselves. . . .

DISCOUNT SHEET.

Referring to the resolution passed at our last convention recommending that manufacturers and jobbers be requested not to sell goods to the consumer except to those who were already exempted by our former national discount sheet, it is proper to report that so far as my observation has gone this resolution has not had the slightest consideration from either the sellers of goods or our members. The measure of disrespect it has received from all directions is sufficient to teach that no possible good can accrue to your association from this policy or any other wherein the manufacturer or jobber is expected not to sell to the consumer. The only thing that has been of any avail in that line was the original discount sheet, which it is undoubtedly safe now to again reinstate, but on slightly different lines.

The storm created by the circular relative to it (that was issued in 1892) has now blown over, and experience has taught that it would have been wiser to couch it in milder language; and had this been done, beyond a doubt there would have been no sharp criticism upon it. The fault of the wording of the circular you can attribute to me. I am not willing, however, that you should charge I am not ready to learn from experience.

Personally I am of the opinion, based upon close observation, that much more can be accomplished through appealing to the sellers of goods than by demanding. No firm in the United States can successfully cover up a method of selling to the consumer at trade prices. It will get into the atmosphere in spite of them, and they cannot escape the odium that will positively follow, provided you maintain your organization and keep any recorded data of this character.

HOT WATER BOILERS.

We have had some letters relative to the hot water boiler plague during the year, and in addition to this I have held conversations from time to time with a few in that line with reference to the disagreeable features in connection with the present practice. I have endeavored to induce one very competent gentleman who has had a large experience in handling boilers with the trade to write an article upon the subject. I hoped at one time he would do so, but later on he informed me he was too busy. I am inclined to think it is a question he felt more like giving up than attempting to recommend a remedy for, feeling possibly that he could not do the situation full justice. I do not believe anybody could. While a few have punished themselves sufficiently by losing money on taking contracts a large number seem still to continue in the business.

I saw a reference a short time ago to the importance of a man being protected against himself. I think there is a good field among the hot water boiler people for some enthusiast to do a great mission work in this direction that could be classed as a blessing pure and simple.

AMALGAMATION.

The question of amalgamation of the two associations of master steam fitters and master plumbers, which has been discussed pro and con, and of which President Hudson spoke very decisively in his report last year, has been decided for the present at least. . . .

CONCLUSION.

It is painful, indeed, to be called upon to announce to you so long a list of losses by death of valuable and worthy members in our organization since our last meeting: Herman A. Kroeschell of Chicago, Hazen Mooers of Milwaukee, I. Lincoln, Jr., of Chicago, George Strong, president of the

Joliet local, and William Costello of South Boston, Mass.

In conclusion, in grateful appreciation of the support of our president and Executive Committee and of many faithful and energetic members in the work for you, I wish to express my most earnest thanks, and to add that the future success and dignity of your commercial affairs depends largely upon lines mapped out at this meeting. I say this, believing that no convention you have yet held can be classed with it in importance. Recognizing how easy and natural it is to err causes me to look upon the results of your present gathering with much concern. In proportion as you study and prepare in the interest of the whole will you best serve yourself individually. No single person's interest to the detriment of the mass of you should receive one moment's consideration. This last remark particularly includes your present secretary.

Hoping that the best possible action in your behalf will prevail, I again thank you, one and all.

At the close of the secretary's report P. S. Hudson was called upon to read a communication from the ruler of these parts presenting the keys of the city. It was a humorous production involving the most extraordinary sequence of misapplied epithets and double meaning words.

The treasurer, E. D. Smith, then reported receipts of $8843.90, and disbursements of $8626.36, leaving a balance of $217.54.

J. L. Wells next read the report of the Executive Committee, from which we quote as follows:

Executive Committee's Report.

The reports of our president and secretary having covered all congratulatory features leave us no duties to perform in that direction any further than to say we welcome and are indeed glad to meet you, and we are with you, of you, and for you.

The chief work at this convention is to endeavor to anticipate what the conditions before us are likely to be, and to plan wisely enough to meet them in the most substantial and far reaching manner, remembering always that we are ever nearest success when we are adhering to the lines of consistency and justice.

This sentiment should be carried particularly into our local relations with each other, as well as our national. New lines, new men, new ideas and developments of every description are constantly being introduced. Those who are attempting to do their business to-day, locally or nationally, upon the conditions that existed two, five, or ten years ago, will learn later to their sorrow that they have not fully kept abreast of the unceasing march of progress they are ever forced to come in contact with.

While it might have been comparatively safe ten years ago to presume upon a continuance of given patronage, it will not do to build upon any such expectations to day, when younger men are inheriting seats at the commanding desk, bringing to it new conditions, new associates and new friends made in other channels and at other clubs. No single firm can stand now and successfully say, "We are the people." Where it was once mostly multiplication and addition it is now nearly all division and subtraction. We must not forget that the school house of the present is preparing well equipped contract seekers more rapidly and in greater numbers than in the past. Added to this, they have the advantage, through the numerous trade schools in different sections, of becoming practical and trained experts in a time brief compared to the old methods of developing men. Hence the necessity of those in the business now following lines that are least likely to leave their profits with those for whom the work is done. There is nothing rational in conducting our business at cost prices this year with a view to advertising, trusting that by such means we shall insure an increase of patronage later on to which we may add fair profits. . . .

In answering the questions many times asked in regard to the value of our organization, and what it has accomplished, it is to be regretted that the sum total of what the association has prevented in the way of disaster coming upon our trade cannot be pointed out, and it becomes doubly lamentable when we remember that it is a condition none realize or appreciate, even in a fractional part. . . .

It is perhaps due you that we refer to our lack of membership in cities with less than 75,000 inhabitants. There is no doubt but that the firm stand taken by steam fitters in our large cities reflects a benefit to the lesser ones referred to, and there is no question either but that the disorganized condition in the smaller cities reflects detrimentally to the larger ones. It is certain that if steam fitters in these cities would take steps to benefit themselves through organization and become members of the national, the result universally would be of great benefit.

The query arises, why do they decline to do this? We have a few men in cities of less than 50,000 inhabitants who have benefited themselves wonderfully, and they are a substantial aid to our organization. If there could be a general, spontaneous uprising of such a character in all these cities the good returns would be beyond any man's power to foretell. They can have a membership with us at the rate of $10 per year, and the amount it would cost them to maintain their local would be merely nominal. Can it be possible they think it is profitable to them to save these small amounts? Surely they could not prove that it is by those who have tried it in an earnest and substantial manner.

This has been a problem of much concern to every former executive committee, as well as the present one. There has been much thought and work devoted to inducing such parties to join with us and thus rectify many irrational things that exist among us. It has been impossible thus far to move them, and it is beyond our power at the present time to point out a remedy, but we do hope that at this convention some one will be able to make suggestions which will prove profitable in this direction, or else, as our president suggests, we should look after our own affairs and cease further urging in this direction. The national association up to date has been almost wholly supported by the larger cities, and possibly we shall be forced in the future to rely entirely upon these sections for maintenance without endeavoring to do any particular good outside their limits, for surely it is discouraging to be forever pleading in vain.

Relative to the house heating boiler question, as slightly touched upon by the secretary in his report, we think this feature should be again gone over at this meeting. Possibly some one may have a recommendation to make. We suggest that a committee be appointed to consider the matter. Some of the boilermen who have had a wide experience in installing work claim to have abandoned that practice. We suppose it is fair to assume that others will, through the same experience, later on do likewise, but we must admit that it is slightly aggravating to have to wait for these people to gather in this very costly knowledge.

It would not be so provoking if the losses and injury all fell upon themselves, but that is not the case. It reflects on all of us, and their patrons as well. It forces us in many instances if we take contracts to leave our profits with our customers, while on the other hand we are injured by the imperfect work put in from time to time after it is learned that the contracts have been taken at figures that are sure to cause a loss of money; for surely when they do that they are by a necessity forced to furnish as little as possible and put that little in in as cheap a manner as they can conceive of and have the whole pass inspection and get their pay. This injures steam and water heating the country over, for the reason that it causes many to hesitate about using either in small plants. . . .

Committees.

After the reading of this report the president appointed the following committees:

Standard Flanges.

E. P. Bates.
A. C. Walworth.
S. J. Geohegan.

Permanent Headquarters.

E. P. Bates.
A. B. Franklin.
Geo. A. Jackson.

Constitution and By-Laws.

A. B. Franklin.
Wm. P. Thompson.
E. P. Bates.
John Davis.
A. C. Walworth.

Appeals and Grievances.

C. H. Simmons.
A. E. Kenrick.
F. A. Williams.
Geo. H. Morris.

Good of Order.

Wm. P. Thompson.
Jno. W. Danforth.
Wm. E. Bartlett.
J. F. Buerkel.
A. B. Franklin.
P. H. Hudson.

Credential Committee.

A. E. Kenrick.
E. D. Smith.
C. H. Simmons.
Wm. P. Thompson.

Reinstatement of Discount Sheet.

James Curran.
C. H. Simmons.
John B. Hughes.
A. C. Walworth.
P. H. Kendricken.
E. D. Smith.
John Davis.

House Heating Boiler Question.

John W. Mills.
H. J. Barron.
Geo. H. Morris.
John W. Danforth.
Chas. B. Kruse.

Ways and Means, Including Publication of Souvenir.

Wm. P. Thompson.
E. P. Bates.
J. L. Wells.
Geo. A. Suter.
John B. Hughes.
Jno. F. Buerkel.
A. B. Franklin.
W. K. Downey.
John Danforth.
C. H. Simmons.
Alfred Gawthrop.

Guaranteeing Temperature.

E. P. Bates.
Jas. Curran.
John Danforth.
A. E. Kenrick.
Geo. A. Suter.
F. K. Van Court.
S. J. Geohegan.
W. K. Downey.

Resolutions of Sympathy, etc.

A. B. Franklin.
John Whittet.
William S. Phillips.

The session adjourned at 4.30 to meet Wednesday morning at 10 o'clock.

WEDNESDAY MORNING.

Owing to the time occupied in the preparation of the reports of the standing committees the convention did not assemble until 11.30 o'clock. Several committees were called upon for reports, but as they were not ready the first business taken up was a communication from the Massachusetts association on the subject of reorganizing the National Association. The communication was referred to the Committee on Constitution and By-laws. The Committee on Credentials then reported the following delegates present:

List of Delegates.

BUFFALO.

John W. Danforth.
Jos. L Whittet, Whittet, Barrett & Co.
Jos. L. Whittet, proxy for Brand & Ceiger.
Jos. L. Whittet, proxy for W. A. Case & Son.
Jos. L. Whittet, proxy for Clark & Co
Jos. L. Whittet, proxy for J. H. Ruckel & Co.

CHICAGO.

C. H. Simmons, Theo. Jacobs Company.
John Davis, John Davis Company.
P. S. Hudson, Baker & Smith Company.
P. S. Hudson, proxy for Chicago Heating Company.
P. S. Hudson, proxy for Kroeschell Bros.
P. S. Hudson, proxy for John Woodman.
P. S. Hudson, proxy for W. D. O'Brien.
P. S. Hudson, proxy for Geo. C. Mickow & Co.
P. S. Hudson, proxy for Illinois Heating Company.
P. S. Hudson, proxy for F. W. Lamb & Co.
P. S. Hudson, proxy for M. J. Cragin.
D. M. Quay, Wills & Newton Company.
John W. Mills, L. H. Prentice Company.

MILWAUKEE.

Charles B. Kruse, Chas. B. Kruse Heating Company.
Charles B. Kruse, proxy for Davies & Lohman.
Charles B. Kruse, proxy for Cordes & Tries.
W. K. Downey, H. Moores & Co.
W. K. Downey, proxy for M. Coogan & Co.
W. K. Downey, proxy for A. J. Lindeman & Hoverson Company.
W. K. Downey, proxy for Grassler & Gezelschap.

NEW YORK.

E. Rutzler.
E. D. Smith, Baker & Smith Company.
J. L. Wells, Wells & Newton.
S. J. Geoghegan, Gillis & Geoghegan.
F. W. Williams, Blake & Williams.
James Curran, Jas. Curran Mfg. Company.
Andrew Mercer, H. B. Smith Company.
William S. Phillips, Phillips, Doup & Co.
Geo. H. Morris, Johnson & Morris.
Fred. K. Van Court, Bonner & Van Court.
Jno. Neal's Sons.
Peter Backus, of Peter Backus & Son.

MASSACHUSETTS.

P. H. Kendricken, Ingalls & Kendricken.
P. H. Kendricken, proxy for Walker, Pratt & Co.
A. C. Walworth, Walworth Construction Company.
J. F. Buerkel, J. F. Buerkel & Co.
A. E. Kenrick, Kenrick Bros.
Wm. E. Bartlett.
Nutter & Seabury.
John C. Honeyman, Thayer Heater Company.
Daniel Russell.
Wm. Smallman, Isaac Coffin & Co.
John B. Farnsworth.
A. B. Franklin.
A. B. Franklin, proxy for G. M. Parks.
Lawrence E. Milleay.
E. W. Fiske, Smith & Anthony Company, Boston.
H. W. Heath.

PROVIDENCE.

Geo. A. Jenks, Union Steam & Gas Pipe Company.
Henry F. Root, H. F. Root & Sons.
F. Coggshall.
Don J. Husey, proxy for Capital Heater Company.
E. R. Bryant, Pawtucket Steam & Gas Pipe Company.
J. M. Smith, H. B. Smith Company.

PHILADELPHIA.

W. P. Thompson, Thompson Bros.
W. P Thompson, proxy for Reeves & West.
John C. F. Traeschel.

ST. LOUIS.

John B Hughes, Hughes & Stone.
John B. Hughes, proxy for Globe Steam Heating Company.
John B. Hughes, proxy for Doherty Bros.
John B. Hughes, proxy for Missouri Steam Heating Company.

Isolated Members.

Alfred Gawthrop, Alfred Gawthrop & Bro. Company, Wilmington, Del.
John C. Brison, Brison Plumbing & Heating Company, Wilmington, Del.
John Collis, Des Moines, Iowa.
Peter Forve & Bro., Wilkes-Barre, Pa.
H. A. R. Dietrick, South Bethlehem, Pa.
C. Y. Beach, Bridgeport Steam Heating Company, Bridgeport, Conn.
E. P. Bates, Syracuse, N. Y.

After the report of the Credential Committee was received the following resolution, presented by Jno. W. Mills, was adopted:

Whereas, We learn with pleasure that the annual convention of the National Association of Master Plumbers, now in session at Detroit, is a success both in attendance and enthusiasm: therefore

Resolved, That we wire our congratulations and hopes that both our associations will be successful in receiving that protection which we both need to insure our success.

In accordance with this resolution the following telegram was sent:

We send congratulations on your successful meeting and hope each association will secure complete trade protection.

At this point in the proceedings A. S. Purdy of Toronto, Canada, was introduced to the meeting and spoke on the subject of extending the organization to Canada. The matter was referred to the Committee of Ways and Means.

After it had been decided to devote the afternoon session to the reading of papers a communication was read from H. Brill, general manager of the New York Trade School, inviting the delegates to visit the school while in the city. On motion of A. B. Franklin it was decided to accept the invitation and visit the school early Thursday morning.

L. D. Sherman, who represented the manufacturers, was introduced and asked if the convention would be free for the entertainment provided for Thursday afternoon and evening. He also invited the delegates to an entertainment for Wednesday evening. Adjournment was then taken at 12.30 o'clock till the afternoon.

WEDNESDAY AFTERNOON.

The delegates assembled at 2.30 o'clock and the proceedings were begun by receiving the report of the Committee on Revision of Discounts, which was submitted by Mr. Curran without reading, the meeting deciding to postpone the discussion.

As provided for at the morning session, the next order of business was the reading of papers. The first presented was on "English Practice in Heating and Ventilation," by David M. Nesbit of London. Mr. Nesbit illustrated his paper with diagrams on the walls of the convention hall, which added to the interest of the essay.

The second paper, on "The Difference in Amount of Radiation Required in Buildings of Good and Poor Construction," by E. P. Bates, was listened to with much interest. The paper is printed in full elsewhere. The third paper of the afternoon was entitled "Types of Heating Boilers in the United States" and was read by A. C.

Walworth. At the close of this paper it was decided to defer the further reading of papers, and on motion of Mr. Kenrick the meeting went into executive session to consider the reports of the committees of Ways and Means and Revision of the Constitution. The meeting adjourned late in the afternoon to meet again Thursday morning.

THURSDAY MORNING.

The convention was called to order at 10.30 o'clock and the proceedings opened by a paper, "How to Benefit the Trade," read by D. M. Quay of Chicago.

The president read a congratulatory dispatch received from the secretary of the National Association of Master Plumbers, in convention at Detroit, in answer to a similar dispatch forwarded to them by this association.

Next in order was a letter received from Chas. Barnett, representative of the National Association of Steam and Hot Water Fitters and Helpers of America, inclosing, for the indorsement of this convention, a copy of the engineers' bill, presented at their last national session, held in Cleveland.

The bill was as follows :

SECTION 1. No manufacturer or employer in this commonwealth having in their employ a person or persons whose duties are the care and operation of stationary (steam) engines or steam boilers, or both, shall exact from said employees any other work than the care of such engines and boilers.

SEC. 2. No person or persons whose occupation is the care and operation of steam engines and boilers, shall, while in performance of that duty, perform any other work that will occasion them leaving their engine or boiler room.

SEC. 3. Any manufacturer, corporation, or person violating any of the provisions of this act, shall be punished by a fine of not less than $50 for each offense.

After discussion the bill was, on motion of D. M. Quay, referred to the incoming committee.

A motion was then made and carried, that the president appoint a committee composed of past members of the Executive Committee to make nominations for officers in the association; and the president having named such committee, another motion was carried to empower the Nominating Committee to make a recommendation as to the time and place for holding the next convention.

A. C. Walworth moved that the new Executive Committee consider the question of expediting the business of the next convention by having the papers printed and distributed prior to the opening of the convention. Mr. Kendricken moved in amendment that the time to be occupied in the reading of a paper be restricted to ten minutes. The amendment being accepted by Mr. Walworth, the motion was carried.

E. P. Bates of Syracuse, in reporting for the Committee on Standard Flanges, produced a flange made on the standard adopted by the last convention, provided by Jenkins Bros. With the aid of a valve he explained the features of the standard flange, the main feature being the drilling of the bolt holes equi distant from a line on the center of the valve stem. He also read a table of comparisons between the dimensions of standard flanges and ordinary flanges.

Mr. Walworth expressed himself strongly in favor of the standard flange.

Mr. Kendricken suggested that prints be published to show the fitter just what advantages he would get in the standard flange.

J. L. Wells of New York then moved that the association adhere to the standard for flanges adopted last year.

G. T. Coppins of the Walworth Mfg. Company expressed the desire of his company to meet the requirements of the standard flange in any reasonable way, but referring to the table of comparisons, he pointed out certain modifications which could be made so as to utilize certain patterns of ordinary flanges without detriment to the general principles of the standard flange, so far as thickness and diameter of material were concerned. A. C. Walworth then moved that the question of modification of sizes of standard flanges where they conflicted with manufacturers' sizes be referred back to the committee, with power to act in the matter.

The two motions being put to a vote, Mr. Walworth's motion was carried and Mr. Wells' motion rejected. The session then adjourned in order that all present might avail themselves of the invitation by the manufacturers to an excursion to Glen Island. It was arranged to hold the next session of the convention at 9 o'clock on Friday morning.

FRIDAY MORNING.

The convention was called to order at 10 a.m. The first business was the report of the Committee on Permanent Headquarters by E. P. Bates, chairman. The committee recommended that the headquarters should be in the city of New York.

J. L. Wells, as chairman of the Executive Committee, recommended that a committee of three be appointed by the president to draft a form of contract with special reference to the guarantee regarding zero weather, and that they report at the next convention.

Mr. Kendricken was of opinion that action should be taken at once and that a report be made in 90 days.

On motion, Mr. Kendricken's suggestion was added to Mr. Wells' recommendation and adopted.

The president called on a number of committees to report, but each report, together with other matters that came up for discussion, was held over for action in executive session. At 11 a.m. the meeting went into executive session.

The committee appointed for the purpose reported the following nominations for officers for the ensuing year, who were unanimously elected :

OFFICERS.

President, H. D. Crane, Cincinnati.
Vice-president, E. P. Bates, Syracuse.
Treasurer, E. D. Smith, New York.

EXECUTIVE COMMITTEE.

J. L. Wells, New York.
A. C. Walworth, Boston.
W. P. Thompson, Philadelphia.
John W. Danforth, Buffalo.
F. A. Williams, New York.

STATE VICE PRESIDENTS.

Illinois, J. W. Mills, Chicago.
New York, Jas. Curran, New York.
Ohio, —— Chafer, Cleveland.
New Hampshire, E. H. Randall, Concord.
Rhode Island, Jas. M. Smith, Providence.
Missouri, J. B. Hughes, St. Louis.
Delaware, A. Gawthorp, Wilmington.
Minnesota, Wm Rodgers, St. Paul.
Michigan, Chas. W. Light, Saginaw.
Colorado, C. J. Reilly, Denver.
Washington, J. H. Griffith, Spokane.
Iowa, H. T. Ahrens, Davenport.
Wisconsin, Wm. K. Downey, Milwaukee.
Sergeant-at Arms, H. A. R. Dietrich, South Bethlehem, Pa.

The committee recommended that the Executive Committee be authorized to fill vacancies by appointment whether such occurs by the loss of a vice president or because the convention has not elected a vice-president for any State, and also to fill vacancies in the committee.

It was decided that the next place of meeting would be St. Louis, but in case arrangements could not be made for holding the convention there it would be held in Cincinnati. The session adjourned at 1.30 p.m. to meet again an hour later.

Odd Items.

THE EXCITEMENT incident to the setting up of exhibits resulted in a laugh against a prominent exhibitor. Failing to find a suitable foundation for the tacks with which he was fastening his show card to the wall, he doffed his coat before renewing his efforts to secure a "tack hold." A neighboring boilerman came along and found it necessary to doff his coat also, and the only available place for depositing it being the spot selected by the P. E., the new comer's coat was laid upon the first. After the P. E. had adjusted his card he donned the boilerman's coat, and though its length was not exactly in proportion to his figure, he did not notice the change and wended his way upstairs. The boilerman having finished his labors, of course had no alternative but to accept the change, which proved all the more acceptable as a pocket contained a goodly roll of the "stuff" with which supplymen provide themselves before attending conventions. It was possibly the need of this material which led to a speedy and satisfactory exchange and explanation.

IF ANY ONE failed to get one of the Smith & Winchester souvenirs it was through no fault of Newland E. Frost, their popular secretary. The souvenir was a donkey's head made of paper, on the balloon principle, with an air hole for inflating it. When

inflated, the head was supposed to represent the fitters' idea of a man who put in a furnace instead of a steam or hot water apparatus. Deflation of the head produced a wailing sound.

THE AMERICAN RADIATOR COMPANY'S parlors were well patronized throughout the convention and seemed to be the center of attraction for the lady visitors. Flowers in profusion perfumed the atmosphere of the rooms and there was a plentiful supply of flowers at all times at the disposal of the visitors, who were received by the representatives of the company.

THE HOLLAND RADIATOR COMPANY made a fine display of various styles of their radiators.

ONE of the most useful souvenirs of the convention was the fountain pen distributed by the American Boiler Company. Instead of the company's imprint on the outside of the pen, why not have had the "yell" of their enthusiastic representatives engraved on it? Here is the yell:

Who are we? Who are we?
The American Boiler Com-pau-ee!
With a hip-o. With a hip-o,
With a hip-o, hip-o he.
It's just as plain as plain can be,
The company that leads is the A. B. C.
With a hip o. With a hip-o,
With a hip-o, hip o he.

THE CRANE COMPANY of Chicago issued a 24-page pamphlet compiled especially for the convention and descriptive of their different establishments. The pamphlet contained many illustrations and was handsome in appearance.

THE HERENDEEN MFG. COMPANY, Geneva, N. Y., were represented by F. W. Herendeen, who took the opportunity afforded by the convention to further extend the company's trade connections. Besides furnishing fans for the comfort of those attending the sessions, the company distributed some handsome leather card cases which were much appreciated.

EDWARD F. KEATING, New York, had a goodly exhibit in comfortable parlors on the third floor. Brown's patent steam traps, Hoey & Conrow exhaust condensers, Hilt's chain pipe wrenches, Trim's pipe wrenches, Marsh's Acme air, steam and water valves were specialties prominent in the exhibit. Mr. Keating was in charge and had for assistants Jos. Keating, Thos. Lang, J. Irlbecher and Wm. Smith.

THE THAYER HEATER COMPANY of Boston had a fine exhibit of Thayer hot water heaters. The heaters presented an attractive appearance, being tastefully painted and decorated. John C. Hanneman represented the company and expounded the merits of the heaters, and the valuable features of the water top or auxiliary dome which formed part of the heaters. In use this top takes the place of the plain top and is connected with the supply and return pipes of the heaters and having a free circulation independent of the boilers it receives the full benefit of the products of combustion, as they are claimed to pass entirely over its exposed surface before reaching the indirect draft.

THE J. H. MCLAIN COMPANY of Canton, Ohio, were well represented among the exhibitors, having a fine exhibit, consisting of a No. 427 Cambridge steam heater and Harvard, Humber, Yale and Sandow hot water heaters. The Harvard and Humber were similar in construction, the Harvard, being intended for cellar use, having an additional jacket. The points in the Cambridge steam heater attracting most attention were the cone shaped water sections and the flared and corrugated fire pot. The peculiar shape of the water sections, it was stated, made the heater absolutely self-cleaning. Another point made was that the sections are all bolted together in milled joints on the outside of the heater, consequently no leakage could arise owing to the expansion and contraction of the fastening bolts. The heater burns either hard or soft coal.

THE DEANE STEAM PUMP COMPANY of Holyoke, Mass., exhibited a line of their steam pumps, consisting of a No. 2 boiler feed, in section; a 6 x 4 x 6 duplex, a 4½ x 2¾ x 4 pump and automatic receiver, and a 2 x 6 triplex electric power pump—a new pump which can be run from shafting or directly from a motor. The exhibit was in charge of John Mullan, W. S. Young and E. S. Denise.

THE IDEAL BOILER COMPANY of Chicago showed a No. 24 Ideal hot water heater, and Geo. E. Downe, the company's president and H. E. Jones, the New England representative, enumerated the good qualities of the heater and drew attention to its deep corrugated fire pot having a true taper, to its unobstructed waterways and its positive and quick circulation. A leading point was that when it was required to increase the capacity of the heater additional sections could be added.

THE FOSKETT & BISHOP COMPANY of New Haven, Conn., exhibited on the main floor a small model of the G. & J. R. Bolton heaters.

J. P. DUGGER, secretary of the Keewanee Boiler Company, Chicago and Kewanee, was in attendance, and looked after the interests of his company.

WHEN BONNIE THORNTON, at the entertainment at the Madison Square Roof Garden, said: "All you steam and hot water fitters throw your money on the stage for the Sick Babies' Fund," who threw one of the Chinese coins forming part of the Ideal Boiler Company's Souvenir?

THE RICHMOND STOVE COMPANY, Norwich, Conn., were snugly ensconced in Parlor 334. They had no exhibit, preferring to take advantage of the display of Richmond steam and hot water heaters to be found at 85 Centre street, the house of their New York agents, A. A. Cryer & Co. Callers were received by B. E. Mallory, Norman Whitelaw, Frank Whitelaw, Geo. W. Clark and Chas. F. Hanss, who also extolled the merits of Richmond steam and hot water heaters and made presentations of elegant souvenirs in the shape of Peacock cigar ash receivers and a combined paper weight and match box bearing the form of a turtle.

THE JOHN SIMMONS COMPANY, 110 Centre street, New York, dealers in pipe and fittings and general supplies, distributed souvenir glass pens, neatly put up in wooden cases, which were very acceptable to all fortunate enough to secure them.

"IT'S SWEET to be remembered," remarked E. N. Squires, the popular secretary and manager of the New York Central Iron Works Company, Geneva, N. Y., manufacturers of the well-known Dunning boiler, as he presented to every one with whom he came in contact a small bottle of Lundborg's perfume, bearing a label embodying the compliments of his company. He also distributed a neat little leather *portemonnaie* bearing the company's card and the motto: "Good 'cents' and dollars buy the Dunning boilers."

HART & CROUSE of Utica, N. Y., were among the leading firms without exhibits, but their exhibitions at previous conventions and their reputation insured them many visitors to their parlor. W. M. Mackay, David Miller and H. L. Anderson showed an aluminum model of the Royal heater and dispensed "royal" cigars, the two forming a happy combination, as it is whispered that second calls were made. Mackay's quick opening hot water valve was on view and its utility discussed.

THE CRANE COMPANY of Chicago, Philadelphia and New York, utilized Parlor 212 for the entertainment of all who accepted their cordial invitation to call and see them. G. Frank Uhler and Waldron Moore, the company's New York representatives, were most assiduous in their attentions and extended the reputation enjoyed by the company.

THE UNITED STATES HEATER COMPANY of Detroit had no exhibit, but Second Vice-President J. W. Mills and Eastern Representative J. L. Saunders were at home in a third-floor parlor and extolled the virtues of the Capitol hot water, Hecla steam and Mascot steam and hot water heaters. "Forty sizes of boilers with forty different sized grades" was one of the impressions carried away by visitors. Another was a neat little match safe of vulcanized rubber, the appreciation of which was shown by its service throughout the convention.

Exhibits.

THE GURNEY HEATER MFG. COMPANY of Boston had a very large exhibit in the basement in charge of Vice-President John A. Fish, assisted by J. G. Forrest, Charles Morrison, J. G. James, W. T. Isaac and James P. Shoop, all popular salesmen of the company. The exhibit comprises a No. 305 Gurney heater, a Gurney double crown hot water heater and a No. 4 and No. 5 Gurney steam boiler, the latest production of the company and recently described in *The Metal Worker;* Gurney radiators and the Yale, a new radiator just brought out by the company. The latter attracted much attention. Mr. Fish described it as the largest radiator loop occupying the smallest space ever introduced, and very valuable where it was necessary to put much in little space.

* * *

JENKINS BROS. of New York, Boston, Chicago and Philadelphia occupied two rooms on the parlor floor, where A. B. Jenkins with J. D. Stiles, H. G. Logan and Mr. Utz entertained callers. Their only exhibit was a line of valves with the standard flanges adopted by the American Society of Mechanical Engineers and the Master Steam and Hot Water Fitters' Association. This was the first public appearance of valves having the standard flanges, and the firm are to be complimented upon their enterprise. They have a full line of patterns and are able to furnish any size called for.

* * *

THE NASON MFG. COMPANY, 71 Beekman street, New York, were exhibitors of their new Nason shaking grate. Chas. Yingling represented the company and explained the principles of the grate and its ability to thoroughly shake a fire, stir the ashes and break clinkers or cinders and pass them through to the ash pan.

* * *

RAYMOND & CAMPBELL MFG. COMPANY.

Conspicuous on account of its polished Russia iron jacket and dainty white trimmings was the Sun boiler, exhibited in the basement by the Raymond & Campbell Mfg. Company of Middletown, Pa. At the head of the stairs leading to the basement was displayed a large card bearing the legend, "The Sun lights the way—take a few rays." The "rays," suspended in rows, were *facsimile* testimonials received from users of the boiler, each testimonial on a separate sheet of convenient size. The stand was in charge of Harry H. Lindemuth, the inventor of the boiler, and Alex B. Johnston, the manager of the New York office of the company, who practically explained how "the Sun do move."

* * *

POWERS DUPLEX REGULATOR COMPANY.

P. MacCallum represented the Powers Duplex Regulator Company and showed the company's regulator as applied to hot water and hot air heaters and hot water tanks. He also showed their device for operating dampers or valves in flues of indirect hot air systems, both with furnace and forced draft, as used in schools, colleges, churches and hospitals.

* * *

THE A. J. BENNETT PATENT RADIATOR ATTACHMENT COMPANY

were represented by A. J. Bennett, who exhibited their Comfort foot rest for direct radiation and their new foot bracket for indirect and furnace heat. The Bundy radiators in the room were used to show the devices to advantage, and the comfort suggested by them was appreciated by all who saw them. The foot rests are made of malleable iron, neatly bronzed or nickel plated, and have upholstered plush rolls or heel supports. They are furnished with couplings to suit any style of radiator on

the market. Catalogues describing the devices were in demand and a plentiful supply afforded.

* * *

THE EATON, COLE & BURNHAM COMPANY

of New York were located in the basement and showed a line of globe, gate and radiator valves and a general line of steam and hot water fittings and fitters' tools. Prominent in their exhibit were a 14-inch by-pass gate valve, guaranteed to stand 500 pounds steam pressure, for use in power houses and places where extremely high pressure is required; a 4-inch pipe machine, and a 2 inch Gem nozzle for fire purposes. The stand was in charge of Geo. E. Walton and Nelson Mervin, the Eastern salesman.

* * *

TIMOTHY KIELEY,

7 to 11 West Eighteenth street, New York, was on the main floor near the office with a line of steam heating specialties covering the Champion return steam trap, high pressure regulator, oil separator, Standard trap, Eureka pressure regulator and positive acting pump governor.

* * *

THE FULLER & WARREN COMPANY

of Troy, N. Y., occupied a prominent position in the basement, where they showed their No. 26 double section self cleaning hot water boiler and their No. 15 hot water boiler, the latter largely used by engine companies as superheaters. They also showed the hot water section used in their combination warm air and hot water furnaces. The arrangement of this section is quite simple. The water entering the boiler is compelled to pass entirely around and over the top of the fire before reaching the cross section, through which it flows and is connected with the next section, in which the same surface is traversed. The flow continues until it reaches the top, where it is distributed by the flow pipe to the different radiators, from whence it is returned to the bottom of the boiler and again circulated. One or more sections may be used according to the requirements, and any section may be tapped to accommodate from a 2-inch to a 3-inch flow pipe. The bottom section is of horseshoe shape tapped for two 2-inch pipes. The exhibit was in charge of R. S. Wood, the secretary and general manager of the company, and J. J. Wilson, the company's heating engineer.

* * *

THE SMITH & WINCHESTER COMPANY

of Boston showed their No. 12 Winchester boiler, lately placed on the market. It is a sectional cast iron boiler with screwed joints, and embodying a large amount of heating surface over and around the fire. It has an anti-clinker rocking and dumping grate and nickel plated trimmings, and is tapped for return in both sides and rear, in order that returns may be easily run no matter in what position the boiler is placed. The diaphragm of the damper regulator is connected by a special fitting to insure cold water contact with the rubber. The stand was in charge of Newland E. Frost, the secretary of the company.

* * *

THE MODEL HEATING COMPANY

of Philadelphia were exhibitors of the only boiler in practical operation. This was their new No. 235 Novelty steam generator. In front of the boiler was a pyrometer attached to a rod passing over the fire, recording the temperature of the combustion chamber. A thermometer at the smoke outlet showed the temperature of the products of combustion when passing out of the boiler. This was to demonstrate the efficiency of the fire surface. A section of the boiler showing the fire surface was also exhibited. A. C. Edgar and M. B. Moore represented the company and intelligently explained the features of the exhibit.

* * *

THE PACIFIC MFG. COMPANY

of 471-473 Eighteenth street, Brooklyn, had a stand on the main floor near the office, where they exhibited the Nelson valves. W. G. Nelson and G. F. Batt were in charge, and explained the working of the compensating disks in the valves. As this was the first appearance of the valves on the market they naturally attracted a good deal of attention. A feature of the exhibit was a valve made of aluminum, and intended for a traveler's sample.

* * *

A. A. GRIFFING IRON COMPANY.

At No. 201, on the parlor floor, a pair of parlors accommodated the A. A. Griffing Iron Company of Jersey City, N. J.; the Powers Duplex Regulator Company, 36 Dearborn street, Chicago, and the A. J. Bennett Patent Radiator Attachment Company, Woonsocket, R. I. The A. A. Griffing Iron Company showed a line of their Bundy radiators and radiator fittings. They also showed a new pipe hanger having a side hinge which, it is claimed, allows of the strength of the hanger to center where the weight of the pipe is located, and a quick opening hot water radiator valve. The interests of the company were looked after by Thomas H. Williams, president, assisted by L. B. Sherman, C. F. Lathrop, John Sabin, John De Barthe, Leonard Elliott, T. Mason and Frank Somers.

* * *

THE SMITH & ANTHONY COMPANY

of Boston, Mass., occupied the coolest place in the basement with their Hub boilers. They exhibited a No. 20 hot water boiler, and No. 118 steam boiler in sections. S. F. Terwilliger and E. W. Fiske, the assistant secretary of the company, were in charge and drew attention to the overhanging fire pot, which brings the water immediately over the fire and concentrates the heat under the crown sheet section. The inclination of the water from the start, it was explained, is upward and from center to sides, and back to center, circulating through every section.

* * *

THE WALWORTH MFG. COMPANY

of Boston had a well arranged and extensive exhibit in parlor No. 330. It consisted of steam and hot water valves for fire purposes, sprinklers, pipe tools, stocks and dies, Stilson wrenches and all kinds of steam and hot water fittings. As novelties they showed a new combination union elbow and valve; the F. P. ball cock, which, it is stated, is absolutely noiseless and will in any size take a 4-inch ball; and the Ashley patent nipple holder. G. T. Coppins, the secretary of the company; E. P. Keen and W. P. F. Ayer were in attendance.

* * *

THE KENNEDY VALVE MFG. COMPANY,

52 Cliff street, New York, made a very nice showing with a line of their extra heavy gate valves, brass and iron globe and angle valves, radiator valves, straightway and quick opening valves. The exhibit was in charge of President D. Kennedy, P. Hartenfells and E. F. Koons.

* * *

THE SPRINGFIELD COIL BOILER COMPANY.

An exhibit attracting a good deal of attention was that of the Springfield Coil Boiler Company of Springfield, Mass. It consisted of a model of large size showing the construction of the boiler. O. D. Adams, the president of the company, and J. Leon Guyon, the New York agent, imparted information regarding the boiler and explained that the hot water enters the lower coils, passes around the fire box into a supply standard which distributes it into the upper coils, whence it passes into column and thence into the steam drum, through the pipes and back to the boiler. The grate is novel, having a reverse action to destroy coning in the center, a common source of annoyance.

* * *

THE BOYNTON FURNACE COMPANY

of New York and Chicago had the largest exhibit in the convention. It consisted of a No. 23 hot water boiler for hard coal, a No. 207 hot water boiler for soft coal, a No. 506 and a No. 608 steam boiler, a No. 48 hot water boiler for hard coal, all of the Boynton line, and three Niagara boilers. An idea as to the ease with which these boilers are set up may be gathered when it is stated that they arrived in parts and were set up completely by three men in 11 hours. The interests of the company were ably looked after by A. B. Marshall, C. F. Armitage and Jos. Smith.

* * *

THE WM. H. PAGE BOILER COMPANY,

Norwich, Conn., were represented by G. H. Weymouth, who exhibited a No. 1 and No. 8 hot water and No. 8 steam boiler of their Volunteer line. Particular attention was bestowed on the No. 1 boiler, it having their automatic regulator attached. The regulator consisted of a cast iron drum extending from the top of the boiler to the hottest part of the water without coming in contact with the fire. The drum is filled with water independent of the water in the system, the water by expansion operating a rubber diaphragm. The boilers were without ornamentation of any kind and just as shipped from the factory.

* * *

THE THATCHER FURNACE COMPANY

of 240 Water street, New York, and Newark, N. J., showed their No. 4 Champion steam heater, the size suitable for 300 feet of direct radiation. It is a horizontal tubular boiler in connection with a cast iron sectional fire box. An advantage in its construction is claimed to be the large combustion chamber for expansion of the gases, allowing them to become thoroughly ignited before going to the heating surface. The heat passes from the combustion chamber through the tubes, and by baffle plates is made to pass over the shell of the boiler before reaching the smoke pipe. The boiler is easy to clean, the tubes being reached from the front door, and it may be cleaned when under fire. Any kind of fuel may be used. The boiler was shown and its principle explained by G. H. Hersey.

* * *

BLAKE & WILLIAMS,

186 and 188 South Fifth avenue, New York, dealers in steam and water heating and ventilating apparatus, were located in a suit of rooms on the third floor, and exhibited Blake's hot water thermostat and a line of Blake's patent malleable iron adjustable pipe hangers. John L. McMaun, the firm's heating engineer, and Matthew Duff proved to be able representatives of the firm and received many callers.

The Entertainers.

The entertainment of the delegates was, as usual, taken in hand by the representatives of the manufacturers assembled at the hotel. On the morning of the first day of the convention the meeting was called to order by R. D. Reed, after which Major E. R. Pierce was elected chairman and L. H. Hart secretary. The principal business before the meeting was the appointment of committees on entertainment and finances. The following is the committee appointed by the chair on entertainment:

L. D. Sherman, A. A. Griffing Iron Company.
R. D. Reed, H. B. Smith Company.
J. D. Stiles, Jenkins Brothers.

The Finance Committee was composed of

A. F. Gartz, Crane Company.
F. A. Herendeen, Herendeen Mfg. Company.
Scott Coppin, Walworth Mfg. Company.
George Downe, Ideal Boiler Company.
William H. Hill, American Radiator Company.
C. A. Lathrop, A. A. Griffing Iron Company.
D. Paul Hughes, Standard Radiator Company.

Entertainments.

On Wednesday evening the delegates and their ladies attended a concert in the Roof Garden at the Madison Square Garden, at the invitation of the manufacturers, where an excellent programme was provided.

On Thursday the delegates and their friends, as the guests of the manufacturers, enjoyed a delightful excursion to Glen Island. The party, numbering 250, left the hotel shortly after 1 p.m. in omnibuses placed at their disposal, and boarded the steamer "Laura M. Starin," and accompanied by a band of music proceeded to the island, which was reached after a pleasant sail up the Sound, extending over two hours. Some little time was spent in the enjoyment of the attractions of the island, and at 6 o'clock the company were conducted to the dining pavilion, where an excellent repast was provided. The following was the bill of fare:

Clam Chowder.
Sliced Cucumbers. Sliced Tomatoes.
Olives.
Steamed Clams,
Hard and soft shell.
Baked Bluefish. Clam Fritters.
Boiled Lobster.
Broiled Spring Chicken.
Asparagus. Boiled New Potatoes.
Ice Cream.

At the conclusion of the repast Mr. Pierce of the American Radiator Company, on behalf of the manufacturers, in a few well chosen words expressed the warm feelings of regard held by the manufacturers of the various articles daily used in the steam and hot water fitting business toward their guests, and the gratification it afforded them to extend some little hospitality. In the course of his remarks he said that in spite of the tremendous financial storm which the country had suffered the manufacturers recognized the fact that during that time the master fitters of the United States had been exceptionally able, compared with other business enterprises, to pay their bills with 100 cents on the dollar. He eulogized their skill as mechanics and their home life, as exemplified in the presence of so many wives and daughters with them at the convention.

President Rutzler, on behalf of the National Association, thanked the manufacturers for their kind sentiments and for the entertainment which they provided so liberally at these conventions.

Geo. T. Coppins of the Walworth Mfg. Company, Boston, acceptably filled the office of tosstmaster.

The first toast was "The Master Steam and Hot Water Fitters' Association of the United States," which was responded to by A. B. Franklin of Boston. The next toast was "The New York Local Association," to which J. L. Wells responded. "Our Guest from England" was the third toast and it met with a hearty response by Mr. Nesbit. The fourth and last toast was "The Ladies," the duty of responding to which devolved upon D. M. Quay.

The company then embarked on the steamer for the return trip, the vessel reaching her wharf at about 10.30 p. m., from whence omnibuses conveyed the party to the hotel, where the opinion was freely expressed that a more delightful outing could not be imagined.

THE MODEL HEATING COMPANY send out a card announcing that they have opened an office in the Builders' Exchange, Room 303, 24 South Seventh street, Philadelphia, where they will be pleased to see their friends.

The Difference in Amount of Radiation Required in Buildings of Good and Poor Construction.*

BY E. P. BATES.

To illustrate the subject before us I will recite my experience in several buildings. In the fall of 1879 I placed a low pressure steam heating apparatus in a building designed for a home for old ladies. Many of the rooms were small, and in order to warm them without question a radiator was placed in each room. Knowing that a high temperature would be agreeable, the calculation was made that 1 foot of radiation would warm 40 cubic feet of air. This we considered very liberal when the fact that we used the Gold sheet iron radiator is taken into account. We were, however, doomed to a very serious disappointment, as the temperature in the rooms on the windward side of the house frequently fell to 50° and sometimes even below during severe cold and windy weather. After recousidering all the conditions we determined to add a large percentage of radiation, which was done, and the building has been thoroughly warm ever since. The amount of radiation added in many of the exposed rooms was from 50 to 100 per cent. over that originally supplied. To my mind the rooms in this building are very uncomfortable, for the excessive amount of radiation required to maintain the temperature produces a very disagreeable condition of affairs, together with the excessive loss of heat through the thin walls and many air leaks. It was soon found that although the ratio of radiation was very excessive, under the existing conditions the condensation was very rapid, and more boiler power was required to maintain the steam pressure. Consequently an additional boiler was supplied at the expense of the heating contractor, which gave plenty of generating power, but all this was accomplished at a heavy proportional loss to the contractor. To my mind, as I review the entire matter, I find that the original calculations for boiler and radiating surface were correct, providing the building in question had been ordinarily well constructed. But from subsequent surveys I conclude that the architect and building contractor produced about as poor a specimen as it was possible to do and have it stand up as a public building. The result is that the amount of fuel needed to warm the building is enormous.

HEATING A COLLEGE BUILDING.

I have in mind another building which belongs to one of our popular colleges. This building was constructed in 1872. The location was on the brow of a high hill, where the front was exposed to the force of the northwest winds. It was the intention of the heating contractor to make this building very warm, and all calculations were made with this object in view. After the apparatus was complete and the weather became cold it was found that many of the small rooms in the west front did not warm to the required temperature, and an investigation was made to determine the cause if possible. We referred to our calculations as to boiler, piping, radiating surface, &c., and found that the apparatus was constructed according to our calculations; nevertheless we were confronted with a number of cold rooms. We finally determined that the only way to satisfy ourselves was to live in the building and keep a record of the temperature, both in the rooms and outside. While this was in progress I visited the building one very windy day, and in entering some of the west rooms I was surprised to find that the hall door would be pulled away from me and shut with a report like a gun. I supposed at first that a window was open, but examination showed that they were closed as tight as possible considering their construction, but the air leakage was enormous, and a large quantity of air was constantly driven through the brick walls of the building. In fact, the volume of air forced into the rooms was so great that the hall door was opened with difficulty. The radiators in these rooms were liberally increased, and the warming of the building has been very satisfactory to its occupants. The heating contractor in this case did not meet with a decided loss, as a very liberal allowance for the exposure of the building had been made in the original calculations.

A STATE NORMAL SCHOOL.

Another striking case comes prominently before me. About eight years since I placed the heating apparatus in one of our State normal schools. The building was in a very exposed location, and the radiating surfaces were very carefully apportioned in order to fully meet all conditions. One large class room, containing about 100,000 cubic feet, was provided with 1 square foot of radiation to 40 cubic feet of space. This was thought to be excessive at the time, but we wished to do the work right the first time, and not have alterations or additions to follow the work, so the full amount of radiation was supplied. When the weather became severe this room was very cold, and radiating surface was added at various times until the ratio was brought up to 1 to 18 and the desired temperature secured. The larger part of the radiation was direct—in fact, all radiation which was added was direct. I found that while standing in the room during a severe northwest wind you could feel the wind on your face as it came through the wall of the building. In the illustrations cited the buildings were very carelessly constructed, the architects in charge giving very little attention to the minor details which have the most important bearing in the comfortable use of the building. I will now call your attention to the reverse of the conditions named above.

AN OVERHEATED RESIDENCE.

Last year I contracted to place a small hot water apparatus in an old residence which was being altered slightly and converted into a small apartment house. The building was not badly exposed, so the calculations were based on a moderate amount of radiating surface. The apparatus was complete in the fall and the tenants moved in. The fire had been started but a few days when there was a general complaint of too much heat, especially in the bedrooms. I found that the latter contained about 1500 cubic feet and a radiator of 32 square feet was used to supply the heat. Our advice was to shut the valve on the radiator and run the water at a lower temperature, and when very cold weather came they would be very happy with nicely warmed rooms. Our suggestions were partly followed, but the complaints of overheating were almost constant, and after passing partly through the winter both owner and tenants demanded that all the radiators be removed from all the bedrooms at least. This was done, and there remained in these rooms a riser of 1¼-inch pipe, which contained about 4¼ square feet of radiating surface in a room of 1500 cubic feet, or a ratio of 1 to 333, the bedrooms being outside rooms. I have never had the opportunity to examine this house, but there is no doubt as to its good construction. I might further say that I am advised that the temperature of the water is kept down to 140° to 160° in the coldest weather.

A WELL CONSTRUCTED STABLE.

A few years since I built a small stable. Its dimensions are 24 x 36 feet on the ground. The ground floor is used for a carriage room, horse stalls, harness room, &c. In practice the floor is commonly used as one room. Above is a hay loft, with a room for the driver over the harness room. To my mind it is desirable to keep the stable moderately warm through the winter and to accomplish this with a moderate outlay in apparatus and fuel. Over the horse stalls is a ventilating pipe running through the roof; this pipe is 12 inches in diameter and is always open, summer and winter; usually the air is going through it at a high velocity. There is no especial provision to bring air into the stable, but the doors and windows are ordinarily well fitted, and there are large leaks about the entrance to carriage room, which has a sliding door about 9 feet square and opens to the north. In using the stable no difficulty was found in warming it to 60° in the most severe weather, and an ordinary globe stove was used with a grate 8 inches diameter. The amount of fuel used per season is between 3 and 4 tons. The stove pipe passes through the driver's room and the heat given out by the pipe maintains a comfortable temperature in that room. I believe this stable is more comfortable in summer and winter than the average

* Read at the sixth annual convention of the Master Steam and Hot Water Fitters' Association of the United States, New York, June 19–21, 1894.

stable, although many of them may be much more expensive in construction. The stable is built of wood, the frame is balloon style, the upright studs are 2 x 4 inches set about 16 inches to centers. On the outside of these studs I placed a course of rosin sized paper and one thickness of coved siding. In order to prevent the buckling of the paper at the laps and to prevent a rapid change of circulation of air between the studs, I placed a 2 x 4 inch lengthwise (between the up right studs) on the sill, then once in 3 feet cut in a 2 x 4 inch as an addition girth. The paper being a yard wide abutted on this extra girth, which held the edges tight and prevented the circulation of air from cellar to hay loft, and *vice versa*. On the inside of the carriage room, as well as other rooms on the ground floor, a course of building paper was used and ceiled over with ⅛-inch narrow Canada pine for a finish. Under the floor of the hay loft was laid a course of building paper, also on the ceiling of carriage room before the ⅛ inch wood ceiling was laid. At the top of carriage room where the studs and joist join I stopped off with boards to prevent circulation of air. The idea of using the cross girths once in 3 feet and building paper on the inside of the walls was very amusing to the old carpenters employed on the work, but it is very satisfactory on a cold day and equally so in hot weather, the building being much more comfortable than many dwellings which are built at a much greater cost per cubic foot. It will be noticed that the stable here described is of very inexpensive construction, and would be very cold in winter and hot in summer except for the succession of dead air spaces in the walls, cove siding being one of the poorest materials for keeping the wind from penetrating a building.

HOW A HOUSE WAS BUILT.

Believing that I was correct in theory, I determined to carry out my ideas more carefully in the construction of a house two years since. This house stands alone, fully exposed on all sides, on high ground in Syracuse, where the temperature frequently falls below zero and occasionally 15° to 20° below zero It is constructed of wood and is comparatively inexpensive. The frame is what is known as balloon with slight modifications. On the outside of the frame are placed hemlock boards planed on one side, and over the hemlock is placed a course of heavy building paper, care being taken to leave no bare places or uncovered knot holes, also that the paper fitted properly around all corners, windows and door frames A 2 x 4 inch was nailed to the sill to prevent the air from cellar going to the attic, or *vice versa;* once in 3 feet a cross girth 2 x 4 inches was cut in between the upright studs to make a dead air space in the walls. This was also done in the partitions. At the ceiling of each story a board to fill the space between the joist was inserted ; said board was covered with building paper. Over the partitions in the center of the house a stop off was inserted in a similar manner to prevent the air from passing from side to side of the house and cooling the ceilings of the various rooms. The roof boards were covered with paper before the shingles were laid. Every point was carefully looked after to prevent air leaks, the object being to get dead air spaces in all the walls as far as it was possible to do this.

THE HEATING APPARATUS.

The next point was to install a good warming apparatus, and after having the old saw about shoemakers' wives and blacksmiths' horses handed to me several times I determined to erect a heating apparatus which would surely warm the house every day. I therefore placed in the house a Bates self-feeding boiler No. 6, containing 103 square feet of fire surface. This boiler is brick set. Allow me to speak of a peculiarity of this boiler. Quite different from many which are advertised, it does not save any coal. They will burn all you fire into them, but if the firing is done with any reason the boiler will give you an equivalent in heat for every pound of fuel it consumes. The house in question being three stories, it was decided to make a combination apparatus—*i. e.*, hot water and steam, using hot water stacks for the five principal rooms and steam radiators for bath, back hall and the small bedrooms. The hot water was circulated from the water line, the boiler being set in the usual way for carrying steam, with automatic water feeder, automatic draft door, &c. I placed in the house, which contains about 16,000 cubic feet of space, 457 square feet of radiation, equal to 1 square foot to 33 cubic feet of space to be warmed. Of the above 350 feet was in the indirect hot water stacks and 127 square feet distributed in seven small radiators. For ventilation I built one chimney stack, which connects conveniently to most of the rooms. In this chimney stack I placed eight tile flues made of vitrified pipe without hubs, and all 8 inches in diameter except the flue for the fire place in dining room, which is 10 inches in diameter. These flues are used as follows: One for steam boiler, one for laundry stove, one to ventilate laundry, being three in basement: on ground floor one for fire place, one for range, and one for hood over range to take off heat and vapor from cooking, being three on ground floor. On the second floor there is one flue from the large bedroom, at the base of which is set a Franklin stove, and the other and eighth flue in the back hall. The bathroom being several feet away from the chimney has a separate flue of tin and galvanized iron extending through the roof independently with a Globe ventilator on top. Every test made shows each flue carrying out a large amount of air, and those flues to which fires are connected are very satisfactory, in fact they never fail to draw, and the course or velocity of the wind seems to make no difference, so it is evident that a rapid change of air is going on constantly.

RESULTS.

As to results. When the thermometer registered 5° below zero during the past winter we used one stack of pin radiators in the reception hall. Said stack contains eight sections The register over the other stacks were kept closed, a radiator of 16 square feet in back hall of second floor was filled with steam, and a radiator of 18 feet on third floor was partly filled equal to 10 square feet, or in all 108 square feet in active operation in severe weather. There is no doubt that we receive some benefit from the stacks where the registers are closed, as there is a small percentage of leakage through the registers, and some heat given off by the tin flues running to the upper rooms. If only 108 feet were used the ratio would be 1 to 135. After having several cold days and demonstrating the fact that the amount of radiation was greatly in excess of the amount which could be possibly used, radiators were removed from the house to the amount of 86 feet of direct radiation and 60 feet of indirect, the latter being the stack placed to warm the drawing room and was not used, as the room was thoroughly warmed by the hall stack. It was found also that during the coldest days and evenings it was comfortable to sit in any part of the house, even the rooms where the registers were closed; also that the difference in temperature between the outside and partition walls was slight. One fact worth mentioning is that the bathroom was in constant use, and that it was designed to heat it by means of a brass coil, nickel plated, containing 20 feet of 1-inch pipe, but the valve was not opened during the winter, the room being comfortable at all times to take a bath. During this season it is my intention to extend the tin flues to three bedrooms from which the direct radiators have been removed, as the stacks are abundantly large to supply them with heat. I might say in explanation that I should not have carried heat enough to raise steam, but for the fact that one of the upper rooms was used for a sewing room, and steam was required to reach that room. In my opinion I shall not need to carry the water above 180° the coming winter to perfectly warm the entire house. Under the conditions here described the boiler ran with the minimum of care, the draft door remaining constantly closed days at a time; the grate was shaken once in 24 hours in the most severe weather, and only once in 72 hours in very mild weather. With a temperature of 32° outside, water at a temperature of 110° to 120° at the boiler was sufficient.

THE APPLICATION.

The question may now be asked, what has all this matter of construction to do with our craft? We do not build houses or other buildings—we must take them as we find them, good, bad and indifferent, and place in them a heater that will fill our guarantee, be it more or less. This is a fact from one standpoint ; there is, however, another view to take of the subject. Every trade is responsible for existing conditions to a certain extent. By agitating a subject we bring about reforms, and if $15 to $40 judiciously expended in the construction of a small residence will save the full amount in the value of fuel in one or two seasons and add largely to the comfort of the occupants all the time, our efforts are well expended in diffusing the knowledge of the fact, and intelligent inquiry will be well rewarded in its research. Further, we all make our great successes in well constructed buildings, and our failures and sometimes losses in those of poor construction. With this in view I hold that it is largely to the interest of the steam fitter and heating engineer to promote in every way possible the desire which the owner and architect may have for a well constructed building "Continual dropping wears the stone."

"FOOD FOR THOUGHT" is the motto on the outside of a miniature meal bag that rouses the curiosity. Further investigation reveals a circular within this little receptacle telling about the Ideal boiler made by the Ideal Boiler Company, 36 Dearborn street, Chicago.

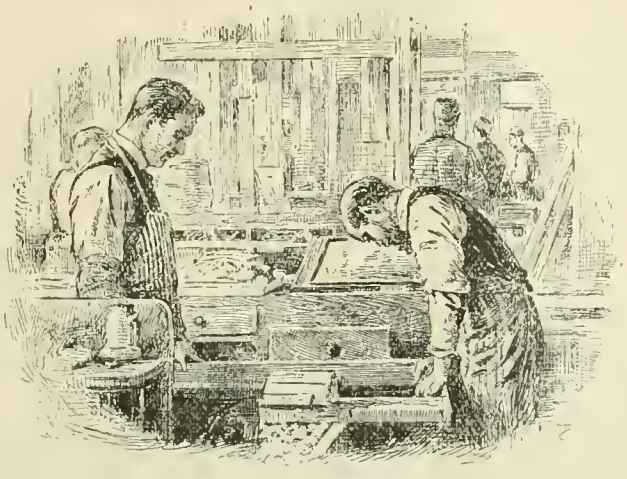
Wire Ropes.

At a recent meeting of the Yorkshire College Engineering Society, in England, Herbert Cheesman of the Hartlepool Ropery Company, Hartlepool, England, read a paper on "Wire Ropes," of which the following is an abstract. After describing the general construction of wire ropes, the lecturer urged the necessity of using wire having the same modulus of elasticity throughout one rope. The object of all rope manufacturers is to obtain an ultimate strength for the whole rope equal to the sum of the strength of the separate wires, and the only way of attaining this result is to use material of precisely similar elastic properties. Another very important point brought forward was the initial torsion given to each wire in the formation of the strands by the "sun and planet" mechanism. This system of preparing the strands is very generally supposed to prevent any twist being given to the separate wires, but it was clearly demonstrated that a slight axial rotation of each wire is necessary to entirely prevent any torsional stress being put upon them. Mr. Cheesman has now brought out a machine which enables the operators to adjust this axial movement to the requirements of the lay of the strand. In speaking of the rotation of wire ropes, Mr. Cheesman pointed out that all long ropes not of a perfectly cylindrical form must necessarily rotate, though they may be fixed at both ends, for they always tend to follow the path of the greatest bearance, which is down the spiral of the rope. This tendency increases with the weight lifted, and he had observed that by raising a kibble empty it made five revolutions, while with the weight of two men it made 11, and when filled with earth 19. The rotation of the rope is advantageous in equalizing the wear. Illustrating the advantages of internal lubrication, Mr. Cheesman quoted the experiments of A. S. Biggart. An unlubricated rope stood 16,000 bends before fracture commenced, while the same rope when lubricated stood 38,000 bends over the same pulley. Another similar test showed that the life of the rope was just doubled by internal lubrication.

The engines of the new United States cruiser "Cincinnati" were given a dock trial last week in the Brooklyn Navy Yard, with very satisfactory results. The "Cincinnati" was designed and built by the Government. Her engines develop 10,000 horse-power and are expected to make over 20 knots on her official trial.

A Visit to a Stove Foundry.

A modern stove foundry is a very complex institution. According to a high authority no less than 25 trades are represented in such an establishment. They comprise designers, modelers, wood pattern makers, plaster workers, iron pattern makers, polishers, electro platers, buffers, carpenters, follow boarders, japanners, casting scratchers, floor molders, bench molders, cupola melters, grinders, mounters, inspectors, tinsmiths, sheet iron workers, brass workers, blacksmiths, flask makers, pipe fitters and machinists. These are by no means forced classifications, with groups of workmen who are sometimes craftsmen of one sort and then of another. Every man employed has a special function in which he is as far as possible an expert. Such an explanation is a necessary preliminary to a description of the art of stove founding as conducted according to the most approved methods of the day. For this purpose the works of The Michigan Stove Company, at Detroit, Mich., have been selected.



A Corner of the Wood Pattern Shop.

Before entering upon technical details, a brief history of The Michigan Stove Company will be of interest, as showing the origin and growth of the establishment which now occupies so prominent a position in the stove trade. The organization of the company dates back to 1871, when articles of incorporation were taken out by Charles Du Charme, Jeremiah Dwyer, Merrill I. Mills and R. H. Long. The central figure in this group of persons was Jeremiah Dwyer, who was the pioneer stove manufacturer of Detroit, having founded in 1862, before the incorporation of any of the present Detroit stove companies, the firm of J. Dwyer & Co., exclusive manufacturers of stoves and ornamental castings. Ground was broken on the present site of the works in March, 1872, and the first heat was taken off in the foundry on September 12 following. The officers of the company at that time were as follows: Chas. DuCharme, president; M. I. Mills, vice-president and treasurer; Jeremiah Dwyer, manager; R. H. Long, secretary. In 1873 George H. Barbour was elected secretary to succeed Mr. Long, who became superintendent, holding that position until his death on April 3, 1876. Charles DuCharme died January 9, 1873, and was succeeded as president by Francis Palms, who held the position until his death in November, 1886. In August, 1872, M. B. Mills became associated with the company and was elected a director in 1878. Charles A. DuCharme entered the company in 1879 and became a director in 1882, when he was also made purchasing agent. The Chicago house was established in January, 1879. On January 1, 1882, Frederic W. Gardner became associated with the company, assuming the management of the advertising department and Western business. The officers of the company at present are as follows: Jeremiah Dwyer, president; George H. Barbour, vice-president and general manager; Merrill B. Mills, treasurer; Charles A. DuCharmet secretary; William A. Dwyer, purchasing agent; William J. Keep, superintendent; Frederic W. Gardner, Chicago. Western manager. The present directors are as follows: Jeremiah Dwyer, George H. Barbour, Charles A. Du Charme, Merrill B. Mills, Francis F. Palms, William A. Dwyer, Edwin S. Barbour 2d, M. W. O'Brien and Frederic W. Gardner. The capital stock of the company was originally $100,000, and was increased at various times until it is now $300,000, but the actual investment in the business is about $1,000,000. The pay roll in 1892, which is taken as an average year, was $595,974, and 75,699 stoves were made. The quantity of pig iron melted in that year was 11,632 tons. The average number of men employed is 1200, and they are kept at work as far as possible every working day in the year to secure the best economical results.

Coming to the methods of manufacture pursued in this establishment as typical of modern practice, the starting point is naturally in the designing room. The high class stoves of to-day not only require the most expert workmanship in their construction, but they compel the employment of creative genius of a peculiar character. Artistic talent must be united with practical ideas. The first step taken is to decide upon the internal construction, arrangement and size of fire pot, grate, flues, oven or heat chambers, dampers, ash pit, &c. The demands of the trade, as gathered through salesmen or direct from consumers, may govern many of these points, or they may have been settled by practical tests instituted for the purpose. Every point in this direction having been covered, the designer comes forward to prepare the shell or overcoat. He makes a flat drawing of about one quarter size, in which the shape, proportions and ornamental features are set forth in sufficient detail to enable his ideas to be clearly grasped. The design is then subjected to severe criticism by experts, and it may be found that a most striking design which would make a very effective piece of stove architecture is impracticable on account of excessive difficulty in reproducing it in cast iron. The design having been approved as drawn or modified, it is then enlarged to the full size of the stove and further criticised. This will probably bring about numerous changes. The next step is to prepare a full-sized clay model. For this purpose a shallow wooden trough is made of the proper width and length for the side of a stove and having the sides beveled to the exact miter. In this trough a perfect reproduction of the accepted drawing is made in clay, requiring great skill and artistic taste. Tops and bases are handled in the same way.

From the clay models plaster casts are made which, when completed and their surfaces blackened, are set up in the semblance of a finished stove. More criticism follows and perhaps much of the work is condemned and must be tried again. Thus the design goes forward slowly. The more elaborate parts are now transferred to wood. Wooden blocks of suitable size are carved into an exact representation of the design. According to old methods these blocks would be hollowed out on the reverse side to the proper thickness for patterns and be used as such—a very expensive as well as unreliable process. By the improved method of The Michigan Stove Company a wax impression is taken from the carved surface and it is used in the preparation of a special metal pattern, composed of lead and tin, cast with the usual allowance for shrinkage in the subsequent stove castings. A

View in the Molding Shop.—Ramming Sand in Flasks.

durable pattern is thus secured which will admit of any kind of rough handling and will not warp when stored away. These special metal patterns are used for the most ornamental or intricate parts of stoves. Wood patterns are made for the plainer parts, as they can thus be more easily and less expensively produced or duplicated. Iron patterns are copies of the special metal and wood patterns. They are finished in the iron pattern shop after they have been cast from the originals. To expedite work in the foundry it often becomes necessary to have a considerable number of patterns of some one part. The equipment of a metal pattern shop consists mainly of vises and files. Surfaces are here made as smooth as glass and abutting edges are fitted together precisely. A small brass foundry is often a necessary adjunct, as holes in the iron patterns are closed with brass, defective edges are filled and straightened and additional pieces are sometimes brazed in place. The pattern department of a large stove works is one of the most expensive in the whole establishment, as will be inferred from the foregoing statements. The pattern expenditure of The Michigan Stove Company for 1892 was very nearly $50,000.

The work of preparation being thus set forth, the patterns will be followed to the foundry. Here, under one roof, all the molding is done. The following description of stove molding is from the pen of Superintendent Keep:

Stove castings are made in two-part flasks, consisting of cope and nowel, hinged at the rear. The pattern is so made that the cope can be rolled off, without loosening with wedges if possible, and give a clean lift (no rats), and bars with nails driven in them are so located as to anchor every hanging core. No separate cores, green or dry, are used in stove work, and the size of the flask leaves only 1 inch of sand outside the edge of the pattern. Stove patterns are of iron filed as smooth as possible, and waxed to prevent rusting. They are boarded face up, that is, fitted to a wooden follow board to give the under side a bearing to prevent breakage, or springing by ramming.

The follow board has wooden cleats on the back, which are bedded in sand on the molding floor, that it may lie perfectly solid. All dust and moisture are brushed from the pattern, as the slightest rust will make a rough surface on the casting. The nowel, which has no bars, is placed on the follow board and sand is riddled through a No. 12 sieve, to lie ¼ inch deep on the pattern. Then sand from the heap is shoveled to fill the flask. This is rammed and leveled off with a straight edge. Sand is thrown over this and a bottom board is rubbed down to give a true bearing surface. This bottom board has holes in it to allow gas to escape.

Iron clamps are placed on each side and the box is rolled over, allowing the cleats of the bottom board to rest on a sand leveled floor.

The follow board is then lifted off, leaving the pattern buried in the sand. If the parting line is not firm, the molder presses sand with thumb or trowel until the edge of the pattern makes a perfect parting with the sand. Parting sand, which is burned molding sand, is thrown over the whole surface, and what has fallen on the pattern and any superfluous quantity is blown off with a bellows.

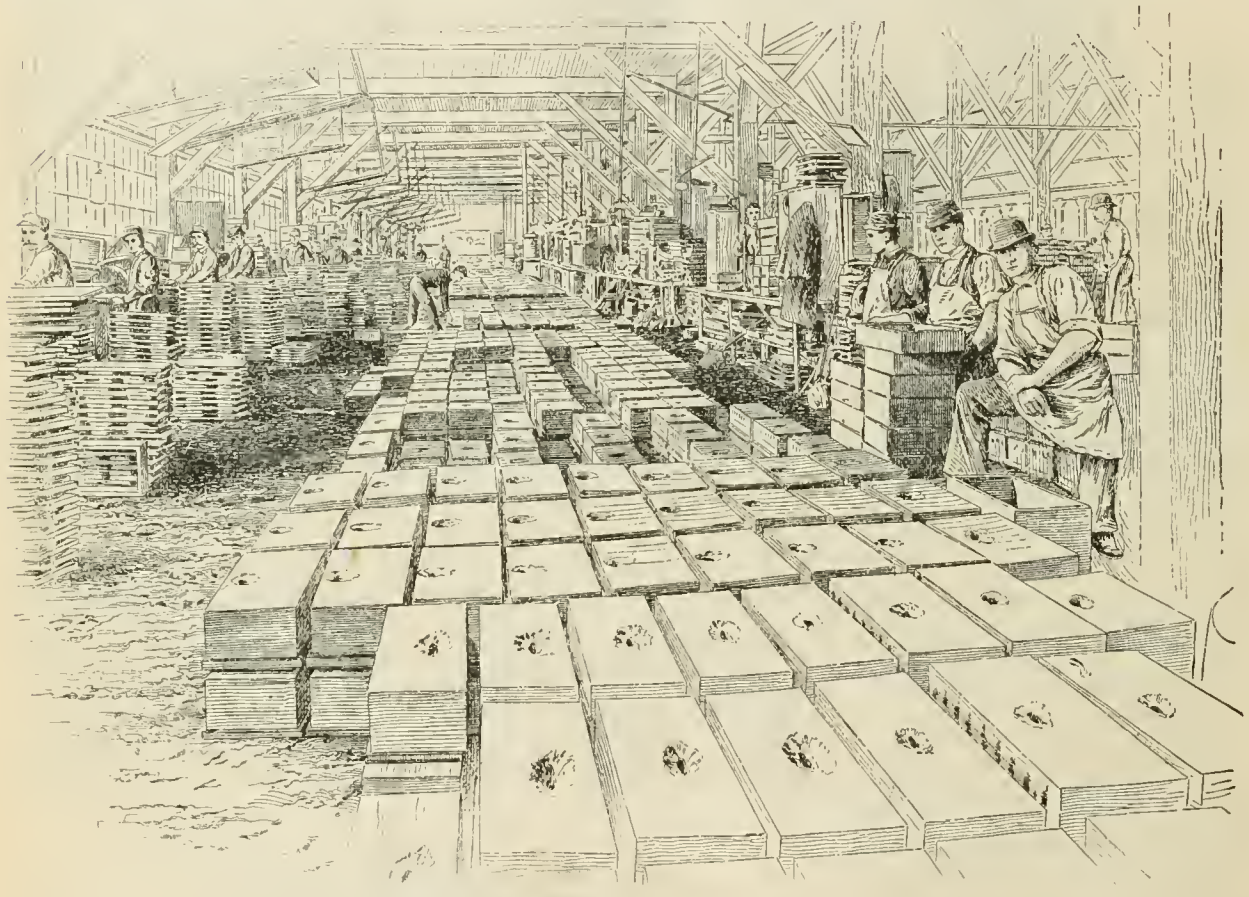
The parting is made by the close fitting of the follow board to the pattern, and any crooked corners are built up with pieces of old leather belting. If the casting is to be run from the edge, iron set gates are placed against the edge of the pattern on the follow board and molded in the nowel.

The parting sand having been blown off, the cope is placed on the nowel and clamped in place, and sprues are placed in position. Flat sprues are set on the pattern, bottom side up. Sand is now shoveled in, and with the hands is tucked under the bars and around the sprues, the flat ones being turned over. The cope is then filled with sand and rammed, the superfluous sand being brushed off. The cope is then rolled off, and rests on its hinges and on a box placed in the rear. The sprues are drawn out, and the inner opening is trimmed with a slick to prevent loose sand breaking off with the inflowing iron. The pattern is now withdrawn, and if there are any imperfections in the mold they are repaired. Heavy facing is shaken over the mold, and when the cloud has settled, light facing is shaken over this, both from muslin bags. The pattern is now printed back, the set gates are withdrawn, and the pattern is removed.

The heavy facing is to prevent the iron burning the sand and to give a smooth surface and a good color. The light facing is simply to prevent the pattern from sticking to the heavy facing. If any heavy facing should stick, it would leave a rough spot—if too much light facing is used it will wash and run before the iron and will make a worse surface than sticky heavy facing.

The mold is now closed and clamped exactly as it was when rammed up.

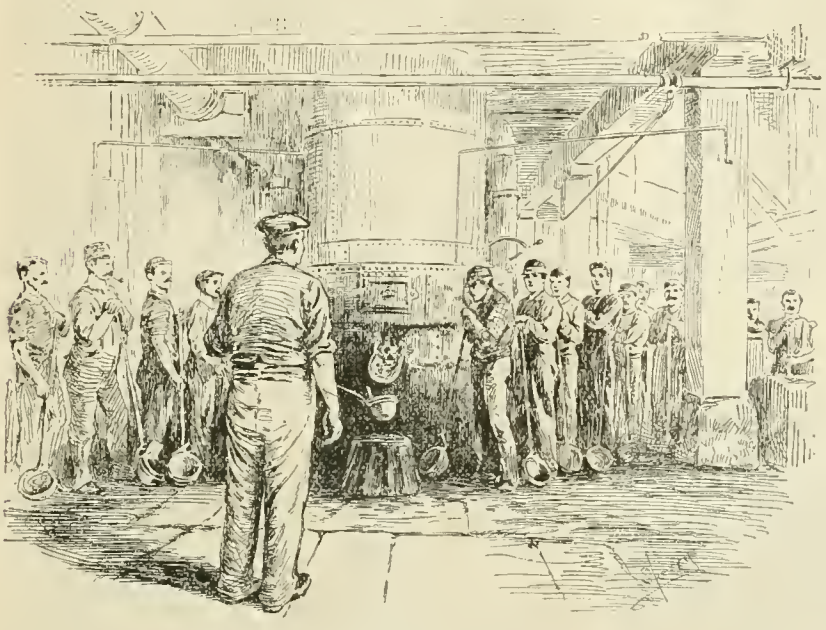
The snap floor extends almost the full length of one side of the foundry. It is intended for molding small pieces. For this purpose snap flasks are used. These flasks are made with hinged sides, fastened by a hook or snap. After the sand has been rammed in place and the pattern removed, the flask is unfastened, taken off and used with another pattern. The sand retains its position for a small casting without the support of the flask. In this way comparatively a few snap flasks form an equipment for a large floor, avoiding the investment of capital in numerous flasks. Large pieces, however, must be molded in stationary flasks, as previously described. These are laid out in floors from 7 to 9 feet wide and about 28 feet long, holding two or three rows of flasks, with one molder to each floor.



East Snap Flask Shop.

The process of casting is very interesting. Two cupolas are in use, located some distance from each other, so as to be convenient to all parts of the molding shop. One is 6 feet 8 inches in outside diameter and the other 6 feet. In these alternate layers of coke and pig iron have been dumped from an elevated platform. After they have been fired, the heat is intensified by a blast of air from a blower in the engine room, connected with the cupolas by under-

ground pipes. This operation is so timed that the molten iron will be ready for pouring when the molders have completed their work of preparing the molds. The cupolas are supported on posts of a proper hight for drawing the metal from the bottom into hand ladles. Everything being in readiness, the molders gather in regular lines with their long handled ladles to receive the liquid iron. The blast is



Ready for Casting.—No. 1 Cupola.

checked, the tap hole is opened and the fiery stream flows down a short spout to be caught by one ladle after another and carried to the different molds. Here a helper with a suitable implement skims the slag or oxidized metal from the top of the ladle, so that only the pure stream of iron flows into the pouring hole in the mold. If the castings are small, the molder flits rapidly from one to another mold, leaving but part of the contents of his ladle in each. If the castings are large, several molders may at the same time pour from their ladles into the one mold. When the ladles are empty they hasten back to have them refilled until the molds have all been properly attended to. It might be supposed that some better plan could be adopted than that of carrying the ladles by hand to all parts of the foundry. Labor-saving devices have been tried in stove foundries, but have been abandoned as less satisfactory than the hand ladles. An enormous amount of metal is carried in this way. The two cupolas referred to melt an average of 67 tons per day, their output having run up as high as 71 tons 13 hundredweight. The men all work here by the piece, every effort being made to help them to earn as much as they can, because in this way will the company also make the most money.

Mr. Keep uses in this foundry his well-known test of cast iron, by which uniformity in results is secured. An iron follow board is used, with gated patterns of a square and flat bar. On this board are placed a pair of yokes, with parallel chilling surfaces 12½ inches apart. The ends of the bars run against these surfaces when poured. The yokes and bars are then taken out of the sand, carefully cleaned and placed on a measuring table, which is a counterpart of the follow board, with openings through it at both ends of each bar. The bars and yokes are placed on it exactly as they were in the mold. The shrinkage of the bars from the yokes is then measured with a graduated steel wedge or gauge measuring $\frac{1}{100}$ inch. This will show whether the shrinkage is too great or too little, and whether the iron used contains too little or too much silicon, when the proper remedy can be applied by changing the mixture of iron at the cupola. The same bars are used for making tests of transverse strength and for ascertaining the depth of chill. These tests are carefully and very regularly made, so that the utmost precautions can be taken to insure sound, strong and perfectly fitting castings. Small quantities of aluminum are also used in the cupola mixture, as that remarkable metal, it is said, imparts beneficial properties to iron, making it pour more smoothly, preventing blow holes and making castings less liable to break.

From the foundry the castings go to the scratch room, where the large pieces are cleaned by hand with steel wire brushes and the smaller pieces are cleaned in tumbling barrels from which the dust is exhausted by a large fan. The tumbling barrels are large horizontal cylinders strongly made of cast iron. A portion of the shell is removable, for the purpose of putting castings in and taking them out. On account of the great weight of barrels and contents they are operated by cogged gearing. The cleaning room is located so as to be easily reached from all parts of the foundry. From this point two routes are taken by the different classes of castings. By one route the plainer portions pass to the mounting shop, while by the other route the pieces to be ornamented, japanned or nickeled pass forward until they meet the finished stove in the inspecting room. A system of shelving has been constructed as an adjunct to the scratch room, with a separate rack for each kind of casting large enough to hold the number of pieces made in four days. In the mounting shop a sufficient space is allotted to each man to assemble the parts of a stove, which are brought from the shelves in truck loads. He has graded emery wheels, driven by power, for grinding edges, at which either he or an assistant finishes the castings so as to make them fit nicely in their places. All doors and close joints are fitted with files. The castings which are taken by the other route go to the grinding and polishing room, in which there are emery wheels of many sizes and shapes. Some of these wheels have convex surfaces to work in indentations, while others have concave surfaces to work on curved castings. These wheels are made on the premises, so many being used that a special department was formed for the purpose. Circular wooden blocks constitute the centers. A heavy coat of strong glue is applied to them, after which they are covered with ground emery of varying degrees of fineness, according to the work to be done. Polishing follows the grinding. This is accomplished with very fine emery wheels and bull-neck wheels made of heavy leather. No belts are here used for polishing, as it has been found that better results are obtained with wheels. Parts to be japanned are taken to the japanning department, which contains a complete equipment for applying the durable glossy coat. They then go to the gilding, ornamenting and striping department. The parts to be nickeled receive much more elaborate treatment. They are placed in tanks and scrubbed with potash and hot water, then with pumice stone, after which they are washed in hot water and lastly with cold water, when they are ready for the nickel bath.

In the Polishing Room.

The nickel plating department of this establishment is on an unusually large scale to meet the requirements of the company's business. Special dynamos furnish the electrical current necessary, and about 6000 gallons of solution are in constant use.

After remaining in the nickeling tanks a sufficient time the castings are taken out and dried, when they pass to the buffing room, in which the wheels used are made of Spanish felt. This imparts the very high polish that is a conspicuous feature of nickeled work. From the buffing room, after the pieces are carefully inspected, the next step is to the nickel packing room and from there to the general inspecting room, where decorated parts meet the completed stoves from the mounting shops. Crating with wood next follows, after which the stoves are either shipped or stored in the warehouses to await the demands of the trade.

A peculiar feature of the stove business, in which it is unlike almost any other manufacturing industry, is the practice of furnishing repairs or new pieces for any part of a stove. As there are from 75 to 300 separate pieces in every high-class stove, and such stoves are made in a variety of styles and in a number of sizes, requiring an immense number of special castings, it will be seen that the furnishing of repairs is a most intricate matter, requiring elaborate arrangements in order to conduct it satisfactorily and economically. The Michigan Stove Company's system is very complete. In the basement of their main building, and overflowing into an extension which was found necessary, are an enormous number of racks, laid off in aisles, built up to the ceiling, and all numbered and indexed, in each of which are stored parts of stoves. This part of the establishment is appropriately christened "the catacombs," as it is a perfect labyrinth of passages in which it would be an easy matter for a visitor to lose himself. The racks are constructed so as to hold a certain number of pieces, and whenever one becomes nearly empty orders are sent to the foundry for more castings of the same pattern. From this stock any part needed to repair any stove made by the company from the beginning of the business can be furnished instantly, or all the parts essential to the construction of a stove of a particular pattern can be easily assembled.

In the Grinding Room.

Manganese Ore in Russia and Greece.

In a late report to his government the British Vice-Consul at Poti, in the Caucasus, makes the following statement in regard to the production of manganese ore in that district: "The Caucasian manganese appears able to compete with that of any other part of the world, and is largely shipped, not only to England and the Continent, but also to the United States. Last season did not, however, prove a profitable one to those engaged in the trade, partly on account of the drop in prices owing to the anticipated opening of the railway to the mines, partly because of bad trade in England and America The new narrow gauge railway from Chiatur to Sharopan was opened during the autumn, but frequent landslips and the want of sufficient rolling stock have hampered its operations, and it does not appear probable that for some time it will be able to bring down nearly all that is mined. Ultimately the effect will be to divert the trade entirely from Kvirili, its present headquarters, to Sharopan and Chiatur, the termini of the branch line." Another agent of the British Government, James Boyle, in a report on the trade of the Laurium district of Greece, shows that the production of manganese ore in that district amounted in 1893 to 178,098 tons. In connection with the subject, Mr. Boyle makes the following observations: "It may interest buyers in the West of England to know that new discoveries of large lodes of manganese iron ore are rendering it very abundant. Attention should also be called to the fact that the best of these ores is often slightly impregnated with arsenic."

Cast Iron vs. Forged Soft Steel Brake Shoes.

Charles T. Schoen has written to the *Railroad Gazette* a letter on the relative merits of cast iron and forged soft steel for brake shoes. He says:

The question as to what metal is best adapted for use for brake shoes is of vastly more importance than one would suppose, if only a passing thought be given it. The main points to be considered in deciding the question are: First, economy in wear, considering the first cost of each; second, relative wear of wheels; third, the coefficient of friction or retarding power.

It has been demonstrated by tests in service that one brake shoe made of forged, soft, low carbon steel will outwear about seven cast iron shoes; or, in other words, the wear is 1 pound of soft steel shoe to 8 pounds of the cast iron shoe for the same service. This answers the first question to be considered in favor of the soft steel shoe, because the cost of it per pound is but three times that of cast iron, while the demonstrated practical value is eight times.

The second proposition is the relative wear of wheels, and there has been room for doubt whether the soft steel would not wear the wheel faster than cast iron; this doubt comes from the fact that friction has generally been connected with wear, the assumption being that the greater the wear the greater the friction, but this is now known to be dependent upon the nature of the material. The results, from a long period of tests, show that soft steel does not wear steel tires or chilled wheels any more than, and not as much as, cast iron shoes. The reasons for this are obvious: The steel shoes to wear the wheel faster than cast iron would have to be harder, but the fact is they are softer, having only 0.10 carbon. The question naturally arises, If the steel is softer, how is it that it only wears one-eighth as fast as cast iron? The answer is simple, and embodies the secret of the economy of the soft steel shoe. Soft Bessemer steel is homogeneous, and the molecules, although soft, hang tenaciously together and resist separation, so that they are not readily pulled apart by the friction, thus reducing the wear. Cast iron, on the contrary, is not homogeneous, and the molecules are not held together with anything like the force that exists between the molecules of soft steel, and the particles separate easily and fly off, just as the particles fly off from emery wheels. In other words, the real cause of the excessive wear of cast iron shoes is the waste occasioned by the separation of the particles from each other, and the falling off without having performed any really useful function in braking.

The third question about the coefficient of friction, or retarding power, is one that is still unsettled. The reports of tests show that the retarding power of the soft steel is as great as, if not greater than, that of cast iron. Yet we can easily see how the retarding power would not be as great with hard steel shoes as with cast iron, but on this point it is well to wait for the data from the M. C. B. Committee on Laboratory Tests before going too far in reaching a decision as to the coefficient of friction.

Besides other incidental advantages of a long wearing soft steel shoe, there is the all important one of the less number of times the shoe has to be changed, and the decreased inspection required to keep up the slack.

Great interest is felt in the criminal proceedings taken by the District Attorney at Washington against the newspaper correspondents who refused to testify before the Senate Investigating Committee, now sitting to inquire into what is known as the "Sugar Scandal." Indictments have been found against the correspondents, and they will be tried in the Criminal Court.

TRADE REPORT.

Metal Market.

Pig Tin.—Excessive supplies and a spiritless consumptive demand have induced a weakness in the market for Pig Tin. Sales of comparatively large lots have been made as low as 19.57½¢ for July delivery and 19.65¢ for the balance of the year. Jobbers' prices for small lots of Straits Pig rule from 20¼¢ to 21¢ ℔ lb.

Copper.—Business during the week has been so narrow that the present true market value of Copper is extremely difficult to arrive at. The consumption, according to most accounts, both in this country and in Europe, is fairly liberal and has been somewhat stimulated by the unusually low prices that have prevailed of late. Yet orders from small consumers appear to be no larger in volume, and jobbers' prices remain unchanged at former quotations.

Sheet Copper.—The demand has eased off somewhat as compared with last week, leaving much to be desired by manufacturers of Sheet Copper. Prices for Manufactured Copper remain at their former level.

Pig Lead.—A fairly large business has been transacted during the week, and prices show more firmness. It is stated that washouts at producing points have checked the output more or less, that smelters are well sold up and that speculative holdings have been reduced to comparatively small proportions. Jobbers ask from 3⅝¢ to 3¾¢ ℔ lb for American Pig.

Lead Pipe and Sheet.—The market is very flat and consumers continue indifferent. The manufacturers have issued a revised price-list for Pipe and Sheet Lead, to which reference is made in another column. The reduction amounts to ¼¢ ℔ lb on Pipe and ¼¢ on Sheet, with the usual 20 % discount.

Spelter.—No change has taken place except perhaps that the better tone which developed last week has made some headway. That is to say, the offering is more reserved and it is more difficult to buy at prices that were commonly quoted early in the month. The common price asked for small retail lots of Western is 4¼¢ ℔ lb.

Antimony.—The market has been quiet and prices have shown very little change. Jobbers' prices for small lots is about 10¾¢ for Cookson's and 9¾¢ for Hallett's.

Nickel.—The popular quotations are 45¢ @ 50¢ for fair sized lots.

Tin Plates.—There has been little change in the Tin Plate market, or in the character of the demand, which is still confined largely to purchases of moderate quantities for immediate consumption. Some fair spot orders have been placed, and a few transactions in futures are noted. The market, as a whole, has, however, been irregular, reflecting the condition of uncertainty in which consumers are now existing. A number of large users of Tin Plates are supposed to be holding off their orders until the last possible moment, in view of the probable imposition of tariff changes. The domestic manufacturers are almost all as busy as they can be, with orders enough to keep their works running for some time to come. Prices keep remarkably level, though they are still low. A special cable dispatch to *The Iron Age*, dated London, June 20, reports that Tin Plate prices in the British market have further hardened, but the demand is not equal to expectations. Forward business is restricted, as sellers expect a good advance shortly. Fair sales have been made of 14 x 20 Bessemer Cokes at 10/3 and Siemens at 10/6, f.o.b. Swansea. Present quotations at that point are as follows:

Bessemer Cokes, 14 x 20	@ 10/3
Siemens Cokes, 14 x 20	@ 10/6
Ternes, double box	@ 19/
Charcoals	13/ @ 15/

Sheet Iron.—A good business has been done in Black Sheets for roofing purposes, and the demand from Tin Plate manufacturers increases weekly. Mills are hastening to place Tin rolls to meet the growing requirements of this industry. Prices are firmly held. A good inquiry is reported for Galvanized Sheets, but manufacturers are not disposed to quote for extended deliveries. The discount quoted for small lots from store is 75 @ 75 and 5 %.

Chicago Report.

Scrap.—Dealers continue to quote the following list of buying prices, Chicago delivery:

	Per net ton.	Per ℔
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto and Ch
Chicago, Ill	$5.25	$5 50
Milwaukee, Wis	5.25	5.50
Kansas City, Mo	8.45	8.70
Council Bluffs, Iowa	8.45	8.70
Lincoln, Neb	8.60	8.85
Sioux City, Iowa	8.45	8.70
Aberdeen, S. Dak	8.50	8.75
Dubuque, Iowa	6.55	6.80
Madison, Wis	6.75	7.00
St. Paul, Minn	7.75	8.00
Burlington, Iowa	6.75	7 00
Des Moines, Iowa	8.20	8.45
Davenport, Iowa	6.55	6.80
St. Joseph, Mo	8.45	8.70
Leavenworth, Kan	8.45	8.70
Omaha, Neb	8.45	8.70

TARBOX MFG. COMPANY, New London, Conn., proprietors of the well-known Tarbox Stove Gloss, are putting on the market in 10-cent bottles what they describe as "The Nineteenth Century Stove Polish" and sell under brand 13½. It is a water blacking for hot or cold stoves, which is always ready and easily applied. One bottle, it is claimed, will make four when diluted. Circulars will be sent to the stove trade on application.

CONDITION OF THE

Hardware Trade.

TRADE CONTINUES in moderate and diminishing volume, as is expected at this season. Some of the larger houses are covering their requirements for early fall trade, but orders are placed conservatively and not for as large quantities as usual, the policy of keeping near the shore being still quite generally followed. There is a fair though not heavy business from the smaller trade, with many of whom the demand is much more limited than usual, and they are accordingly keeping their stocks down to as low a point as possible. The declines which have occurred in prices during the past year induce a closer adherence to this policy than would be the case if the market had not for a long time been a declining one. Whether the bottom has yet been reached is a question which careful men are canvassing. It is the opinion of many manufacturers that prices in many lines are not at all likely to go lower, and when the reaction comes from the sluggishness of trade, it is considered probable that there will be a strengthening in values, in some lines at least, and a scarcity of some goods is not improbable. It is hoped that the tariff question, the delay in the settlement of which is having so mischievous an influence on business, will be disposed of before long, so that there may be at least an opportunity for a good fall trade.

Advices from Chicago.—Extremely hot weather prevailed all over the West last week, causing an unusually heavy demand for Refrigerators, Window Screens, Screen Doors and other summer goods. The large number of rush orders thus received indicated very forcibly the conservatism with which retail merchants had purchased stocks of such goods in advance of the season. Ordinarily, the demand would have been light for some time after the advent of hot weather, or until first stocks had been run off. Now, however, the demand is thrown at once on the jobbers, which shows that they have been made to carry the stocks. Hand to mouth buying keeps down stocks in retailers' hands below their normal size, and there is no allowance for even a slight increase in local consumption. Other lines of goods in Shelf Hardware are moving in about the same volume as heretofore, orders being small for sorting up, yet fairly numerous. Sales in the aggregate are running about even with last month. Sheet Iron is beginning to move from jobbers' hands at last. They are receiving plenty of inquiries for prices for immediate delivery and are quoting prices for small lots, which are about what manufacturers charged last year. The stove trade is picking up to some extent. Orders are now being booked for fall delivery, and among them are not a few for good sized stocks. Very dry weather has prevailed through the West for the past three or four weeks, causing a great deal of apprehension for the crops now growing, but on Friday and Saturday local rains broke the drouth and prospects have greatly improved.

Notes on Prices.

Wire Nails—There is a perceptible falling off in the volume of business and most of the mills are well up with their orders. Some of them, in view of the summer dullness, are curtailing their production and preparing to close altogether for a few weeks. The price of $1.10 for carload lots at mill is well

maintained. Small lots from store in New York are held at $1.25 to $1.30.

Advices from Chicago.—Manufacturers report trade very quiet. Even inquiries are light. The factories are reducing their output, either getting down to single turn or stopping entirely. Prices are very firm at $1.20 to $1.25, Chicago delivery. The local situation is now much better, as prices have been relieved of their irregularity. Jobbers' large stocks have been worked off, and a uniform rate of $1.25 is quoted on small lots from stock. While the demand from retailers is not heavy, as they are buying merely what they absolutely need, no objections are raised to the payment of this price.

Cut Nails.—The price remains the same as given in our last report, the market being represented by the quotation of 95 cents to $1 for carload lots of Nails delivered on dock in New York. Small lots from store in New York command $1.10 to $1.15. The demand is only moderate. The Western manufacturers are not competing so vigorously for Eastern trade as a short time ago. A number of the mills are preparing to shut down.

Advices from Chicago.—Local manufacturers are in receipt of a good run of orders, which have accumulated to such an extent that they are anxious to resume operations, but are still unable to do so for lack of coal. Prices are unchanged at 90 to 95 cents for 55-cent average. Jobbers quote $1.10 to $1.15 for small lots from stock.

Barb Wire.—The Barb Wire market is quiet and the mills generally have pretty well cleared up their order books. Prices are well maintained on the following basis for Four-Point Galvanized, delivered: Pittsburgh, $2.10; Cleveland, $2.15; Cincinnati or Allentown, $2.30; Chicago or New York, $2.35.

Advices from Chicago. — Dullness now pervades the trade in Fence Wire, but there appears to be no weakness in prices. The last advance made is maintained. Jobbers report a very light movement from stock and continue to quote Galvanized at $2.35 to $2.40 for small lots and $2.20 to $2.25 for carloads.

Sheet Lead, Lead Pipe, &c. —A reduction has been made by the manufacturers of these goods under date June 20, the following revised prices being announced, which are subject to the usual discount of 20 per cent.:

	Cents per lb.
Lead Pipe	5¼
Block Tin Pipe	35
Sheet Lead	6¼
Tin Lined Pipe	15

Cordage.—There is only a moderate demand for Rope, but prices are steadily maintained. The market is largely in the hands of jobbers as the result of the repeated advances, which gives them an opportunity to sell at factory prices. Large lots, f.o.b. factory or New York, are selling at the following quotations, which are subject only to a discount of 1½ per cent. for cash:

	Cents.
Manila, base	7
Sisal, "	5
New Zealand, base	5

Great American Fish Scaler.—Covert's Saddlery Works, Farmer, N. Y., who are putting this article on the market, are selling it to the trade at $1 per dozen net. The Scaler was described in our last issue.

Glass.—The market on American Glass continues to stiffen as the date for the annual closing down of factories approaches. Some factories have been obliged to close on account of lack of fuel, while others have closed because of the hot weather. One of the largest factories in the Pittsburgh district will close next week, a week ahead of the regular date for closing. The demand is reported fair in small quantities, and orders as being numerous. It is understood that Pittsburgh manufacturers are not inclined to accept new orders at 85 per cent. discount, while the New York market is represented by quotations of 80 and 20 per cent. discount for single or double strength Glass in any quantity. Reports indicate that Plate Glass factories are well supplied with orders, and that prices show firmness at quotations of 70 to 70 and 10 per cent. discount, with an advancing tendency.

Trade Notes.

THE CRAIGHEAD MFG. COMPANY are a new concern who have been incorporated to manufacture Lamps and other brass goods at Shelton, Conn. The head of the firm is Horace E. Craighead, late of the Craighead & Kintz Mfg. Company of Ballardville, Mass. The company have taken possession of the Erschell factory, at Shelton, which will be adapted to the new business.

THE ZUCKER, LEVETT & LOEB COMPANY of New York City have been incorporated with a capital of $100,000 to manufacture Polishing Materials, Platers' Supplies and Electrical Apparatus.

THE LAUFMAN TIN PLATE COMPANY of Pittsburgh, Pa., state that they are rolling their plate of best decarbonized steel and guarantee all sheets to double seam. They are at present offering the trade the following brands: Laufman's Apollo, Tip Top, Freeport and Allegheny. Descriptive circulars and prices will be mailed by the company to applicants.

THIS BEING convention week, it is natural to suppose that every one is interested in steam boilers and everything pertaining thereto. On this assumption our patrons will find entertaining reading in the announcement, presented elsewhere in this issue, of William Vanderman of Willimantic, Conn. The pages which he occupies are devoted to the presentation of the line of steam and hot water boilers and hot water damper regulator which he offers for sale. The illustrations represent general and sectional views of the Samson Boilers, the Vanderman Steam or Hot Water Heaters, the Vanderman Triple Flue Boilers and the Vanderman Hot Water Damper Regulator. Mr. Vanderman is well known throughout the trade as a practical heating and sanitary engineer with an experience of 27 years, during 16 of which he has carried on the heating and ventilating business.

THE EXCELSIOR STEEL FURNACE COMPANY, 38 West Monroe street, Chicago, illustrate several kinds of Register Boxes in their advertisement this week. A complete price list of such boxes was published in their last week's advertisement.

THE INSTANTANEOUS WATER HEATING COMPANY, with Eastern office at 838 Broadway, New York, call attention in their advertisement this week to the goods which they manufacture, and state that every heater is guaranteed as represented. They also state that the trade in New York City and vicinity will find it to their advantage to send customers to inspect the line of Instantaneous Water Heaters which they have on exhibition.

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Metal and Miscellaneous Prices.

CHICAGO, JUNE 21, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Relyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	@ $5.60
IC, 14x20.90 ℔	@ 5.85
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @ 11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	
IC. 14 x 20	@ $5.50
20 x 28	@ 11.00
IX. 20 x 28	@ 14.00
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.60	17.50
	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20, $9.25
Royal, extra, IC, 14 x 20 ..... 7.25
Merion, IC, 14 x 20 ..... 7.00
Almond, IC, 14 x 20 ..... 6.50
Mint, IC, 14 x 20 ..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20 ..... $8.00
IC, 20 x 28 ..... 12.50

Roofing Plates.

Palm, IC, 20 x 28 ..... @$11.50
Palm, IX, 20 x 28 ..... @ 14.00
Empire, IC, 20 x 28 ..... @12.00
Empire, IX, 20 x 28 ..... @15.00
Hickory, IC, 20 x 28 ..... @ 12.50
" IX, 20 x 28 ..... @ 15.50
Alaska (heavily coated), IC, 20x28 @$14.50
Alaska IX, 20 x 28 ..... @ 17.75
Special, IC, 20 x 28 ..... @ 14.75
" IX, 20 x 28 ..... @ 17 25

Westmoreland:
IC, 14 x 20 ..... $6.00
IC, 20 x 28 ..... 12.00

Elwood:
IC, 20 x 28 ..... $11 50

Kenwood:
IC, 20 x 28 ..... $11.50

Furnston:
IC, 20 x 28 ..... $11.00

Juno:
IC, 14 x 20 ..... $5.75
IC, 20 x 28 ..... 11.50

Illinois, Old Method:
IC, 20 x 28 ..... $17.00

E. L.:
IC, 20 x 28 ..... $12.50

Jessie:
IC, 20 x 28 ..... $12.00

Scott's Extra Coated, Stamped and Resqnared, IC, 14 x 20 ..... $9.50
Scott's Extra Coated, Stamped and Resqnared, IX, 14 x 20 ..... 11.00
Scott's Extra Coated, Stamped and Resqnared, IC, 20 x 28 ..... 19.00
Scott's Extra Coated, Stamped and Resqnared, IX, 20 x 28 ..... 22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20 ..... 7.50
" " IC, 20 x 28 ..... 12.50
" " IX, 20 x 28 ..... 15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared) $9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared) 19.00
Taylor'a Roofing, IC, 14 x 20 (Stamped and Resquared) 8.25
Taylor'a Roofing, IC, 20 x 28 (Stamped and Resquared) 16.50
Columbia, IC, 14 x 20 (Stamped) 7.25
" IC, 20 x 28 (Stamped) 14.50
Maple, IC, 14 x 20 (Stamped) 6.75
" IC, 20 x 28 (Stamped) 13.50
Willow, IC, 14 x 20 ..... 6.50
" IC, 20 x 28 ..... 13.00
Enoxall, IC, 14 x 20 ..... 6.25
" IC, 20 x 28 ..... 12.50
Globe, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ..... 12.00
Miami, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ..... 12.00
" IX, 20 x 28 ..... 15.00
" (Redipped), IC, 20 x 28 ..... 17.00

Old Process:
IC, 14 x 20 ..... 9.25
IX, 14 x 20 ..... 11.25
IC, 20 x 28 ..... 18.50
IX, 20 x 28 ..... 22.50

H. B. L., Old Style:
IC, 14 x 20 ..... 7.75
IX, 14 x 20 ..... 9 25
IC, 20 x 28 ..... 15.50
IX, 20 x 28 ..... 18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 3-10¢	3 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5-10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ ℔ A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis. 75@5%

Copper—

Ingot.

Lake.....10¼¢ @ 10⅝¢
Casting Brands.....9¾¢ @ 10¼¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)
Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.33
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)
Discount, 40%.

Slab Spelter—

Western Spelter ..... 4¢

Sheet Zinc—

600 ℔ casks ..... 4⅝¢
300 ℔ casks ..... 4⅞¢
Loose sheets ..... 5⅛¢

Lead—

Soft Pig Lead ..... 4 ¢
Bar ..... 4½¢
Pipe ..... 5½¢, dis. 10¢
Block Tin Pipe ..... 35¢
Sheet ..... 6¢, dis. 10%

Solder—

⅛&⅛ ..... 13¢
Extra Wiping ..... 11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson ..... 12½¢
Hallett's ..... 11½¢

Wrought-Iron Pipe—

1¼ and under, Plain	57½%
1¼ and nnder, Galv	50%
1¼ and over, Plain	67½%
1¼ and over, Galv	57½%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	50%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list 50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$0.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list 70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ ℔, 2 ¢
" " Brown	℔ ℔, 1½¢
" " Purple	℔ ℔, 2½¢
" Ground in oil, B. Red	℔ ℔, 6½¢
" Ground in oil, Red	℔ ℔, 6½¢
" Ground in oil, Brown	℔ ℔, 5½¢
" Ground in oil, Purple	℔ ℔, 6 ¢
Linseed Oil, Boiled, in bbls	54¢@56¢
Linseed Oil, Raw, in bbls	51¢@53¢
Mineral Paints	2@4¢
Orange Mineral	9½¢
Pure White Lead in Oil	6@6¼¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6¼¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¼¢ kegs	7½¢
Sipe's Japan Oil, in bbls. ℔ gal	84¢
Spirits Turpentine, in bbls., ℔ gal	36¢ @36½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, JUNE 22, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots

Small lots	℔ ℔, 65¢
100-℔ lots	℔ ℔, 63¢
Ton lots	℔ ℔, 60¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots	℔ ℔, 63¢
100-℔ lots	℔ ℔, 60¢
Ton lots	℔ ℔, 55¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	℔ ℔, 60¢
100-℔ lots	℔ ℔, 55¢
Ton lots	℔ ℔, 50¢

Antimony—

Cookson	℔ ℔, 10¾¢
Hallett's	℔ ℔, 9¾¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.	
⅛-in. up to 2-in	$0.35	25 @ 30%
5-32-in. up to ¾-in	.36	
1-16-in. up to 5-32-in	.38	
¾-in. up to 1-16-in	.41	
5-16-in. up to ¾-in	.48	
¼-in. up to 5-16-in	.65	
3-16-in. up to ¼-in	1.00	
⅛-in. up to 3-16-in	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger	Special	
2 in. to 3 in., to No. 16, inclusive,	.38	

Copper and Bronze Tubing— 8¢ ℔ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized 50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..12¢ ℔ ℔, net

Ingot.

Lake	10¼¢
Ansonia Grade Arizona	10 ¢
Ansonia Grade Casting	9½¢
Planished	net
Sheet and Bolt	15¢ ℔ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized	60&10%
Lap or Slip Joint Terne	60%

Eave-Trough Mitres—

Lap or Slip Joint ..... list, net

Elbows—

Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized 35%

Stove-Pipe—

Buffalo Four-Piece.

4¼	5	5¼	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.. 20 %

Elbows and Shoes—

Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.

Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2.50	2.80¢
Nos. 17 to 21	℔ ℔. 2.60	2.90¢
Nos. 22 to 24	℔ ℔, 2.70	3.00¢
Nos. 25 and 26	℔ ℔, 2.80	3.10¢
No. 27	℔ ℔, 2.90	3.20¢
No. 28	℔ ℔, 3.00	3.30¢
American B. B.	℔ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment....℔ ℔, 11¾¢@12¾¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel....℔ ℔ 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75@75&5%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig	3½¢@3¾¢
Bar	4½¢
Pipe	5¼¢, 20%
Tin Lined Pipe	15¢. 20%
Block Tin Pipe	35¢. 20%
Sheet	6¼¢, 20%

Old Lead in exchange, 2¾¢ ℔ ℔.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¢
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil:	
Raw, ℔ gal	.. @ .50
Boiled	.. @ .53
Spirits Turpentine:	
In bbls	.. @ .30½
Putty:	
In barrels and ⅛ bbls	.01⅝ @ .01¾
In tubs	.01¾ @ .01⅞
In tin cans	.01⅞ @ .02⅛
In bladders	.01⅞ @ .02¼

Roofing Material, &c.:

Asphaltum, Trinidad Refined, ℔ ton	$30.00@$35.00
Asphaltum, Rock, ℔ ton	$14.00
Coal Tar Felt, 1 Ply, ℔ ℔	.2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft.	$1.85
Roofing Pitch, ℔ bbl	$3.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

"Standard" Pipe, 2 to 6 inches	65&10%
Fittings, Pipe, " "	65&10&10%
Extra Heavy Pipe, " "	65&10&10%
Fittings, Heavy Pipe, " "	65&10&10%
Large sizes of both kinds	65&10%
Fittings for both kinds	65&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼¢	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained

Rosin, C. & D	₩ bbl. $1.42@$1.43
Rosin, E. & F	₩ bbl. $1.50@$1.75
Rosin, G. & H.	₩ bbl. $1.90@$2.15
Rosin, I. & K.	₩ bbl. $2.15@$2.78
Rosin, M. & N.	₩ bbl $2.85@$3.10

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:	
Best Bangor, ₩ sqr	$3.25@$4.50
Pen Argyle, ₩ sqr	3.70@ 4.00
Peach Bottom, ₩ sqr	4.75@ 5.60
No. 1 Chapman, ₩ sqr	3.90@ 4.25
Lehigh Slates, ₩ sqr	3.00@ 4.50
Vermont:	
Sea Green, ₩ sqr	2.50@ 2.75
Purple, ₩ sqr	3.50@ 4.50
Unfading Green, ₩ sqr	3.50@ 4.00
Red, ₩ sqr	9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ½ ..... 13½@14¢
No. 1 ..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.

f.o.b. New York.

In barrels, ₩ lb ..... 4¢
Smaller quantities, ₩ lb ..... 5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ lb ..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.

No charge for package.

5bls., about 500 lb, ₩ lb	5½¢
½ bbls., about 300 lb, ₩ lb	4¢
Kegs, about 110 lb, ₩ lb	4¢
75¢ extra for keg.	
Kegs, about 55 lb, ₩ lb	4¢

5 % dis.

Yager's Soldering Salts.

½-lb bottles, each	30¢
Large quantities, per lb	40¢

Spelter—

Western Spelter ..... 4¼¢
Bertha (pure) ..... 8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ lb ..... 21½¢@22¢
Straits, pigs, ₩ lb ..... 20½¢@21¢
Straits in bars, ₩ lb ..... 21½¢@22¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20	$7.00
Alderly, extra quality, IC, 14 x 20	6.37½
Allegheny, IC, 14 x 20	5.50
" IX, 14 x 20	6.75
Apollo Roofing, IC, 14 x 20	5.50
" " IX, 14 x 20	6.50
Atlantic, IC, 14 x 20	5.75
Bonus, Extra Coated, IC, 14 x 20	6.75
" " IX, 14 x 20	8.25
Buckeye, IC, 14 x 20	7.00
" IX, 14 x 20	8.25
Chicago, IC, 20 x 28	11.50
Central, IC, 14 x 20	5.37½
Climax, IC, 14 x 20	5.50
Columbia, IC, 14 x 20	7.00
Dane, IC, 14 x 20	5.50
DeMilt's First New York, IC, 14 x 20	5.75
" First New Jersey, IC, 14 x 20	6.50
" Mohawk, IC, 14 x 20	5.50
Dunlap's Double Dipped, IC, 14 x 20	8.25
" " IX, 14 x 20	9.50
" Domestic, IC, 20 x 28	12.00
" " IX, 20 x 28	15.00
Empire, IC, 14 x 20	5.75
Extra Central, IC, 14 x 20	5.62½
Flag, IC, 14 x 20	5.25
Flushing, IC, 14 x 20	7.00
Freeport (Hand dipped and Resqured), IC, 14 x 20	7.50
IX, 14 x 20	8.75
Globe, IC, 14 20 x 28	11.00
Hamilton's Best Redipped, IC, 14x20	9.25
" " " IX, 14x20	10.75
Hickory (Resqured), IC, 14 x 20	6.12½
Juno, IC, 14 x 20	5.75
Kensington, IC, 14 x 20	6.75
" IX, 14 x 20	8.00
Knoxall, IC, 14 x 20	6.00
Laufman's Apollo (Resqured), IC, 14 x 20	8.12
Laufman's Apollo (Resqured), IX, 14 x 20	9.37
Leominster, Extra Coated, IC, 14x20	7.25
Lion (Stamped), IC, 14 x 20	6.25
Lula, Best Charcoal, IC, 20 x 28	12.50
" " " IX, 20 x 28	16.00
Manhattan, IC, 14 x 20	7.00
Maple, IC, 14 x 20	6.50
Merchant's Roofing (Resqured), IC, 14 x 20	8.25
Meurer Roofing, IC, 14 x 20	8.50
" " IX, 14 x 20	10.50
Newcastle Real Old Method, IC, 14x20	9.50
" " " IX, 14x20	11.50
Newcastle Genuine Extra Coated, IC, 14x20	8.75
" " " IX, 14x20	9.75
Newcastle Shenango, IC, 14x20	6.12½
" " IX, 14x20	7.62½
Neville, IC, 14 x 20	6.00
" IX, 14 x 20	7.25
N. F. Old Style, IC, 14 x 20	7.50
" " " IX, 14 x 20	9.00
Old Colony, IC, 14 x 20	8.00
Optimus, Best Redipped, IC, 14 x 20	8.25
" " IX, 14 x 20	9.50
Osceola, Hand Coated, IC, 14 x 20	8.25
" " IX, 14 x 20	9.75
Pacific, IC, 14 x 20	5.25
Palacio, IC, 14 x 20	5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20	8.00
Phœnix, IC, 14 x 20	5.62½
Pullman, IC, 14 x 20	6.50
Scott's Extra Coated (Resquared), IC, 14 x 20	9.25
Scott's Extra Coated (Resquared), IX, 14 x 20	10.75
Stanley, IC, 14 x 20	5.50
Superior, IC, 14 20	5.25
Taylor Old Sty (Resquared), IC, 14 x 20	9.25
Taylor Roofing, I , 14 x 20	8.00
Thomson's Pur an, IC, 14 x 20	5.75
Tip Top, IC (Resquared), 14 x 20	6.00
" IX " 14 x 20	7.25
U. S. Monongahela, IC, 14 x 20	6.10
U. S. Redipped, IC, 14 x 20	8.25
Venus, IC, 14 x 20	5.37½
Vigilant, IC, 14 x 20	5.50
Waldo Redipped, IC, 14 x 20	6.75
Westmoreland, IC, 14 x 20	6.25
Willow, IC, 14 x 20	6.25

American Bright Plates—

Almond, IC, 14 x 20	$6.25
Brilliant (Tissue Packed), IC, 14x20	9.00
Brooklyn, IC, 14 x 20	5.50
Climax, IC, 14 x 20	6.00
" IX, 14 x 20	7.50
Excelsior, IC, 11 x 20	6.50
" IX, 14 x 20	7.50
Florence, IC, 14x20	6.75
Florida, IC, 14 x 20	5.75
" IX, 14 x 20	7.00
Hazel, IC, 14x20	5.50
Iowa, IC, 14 x 20	5.75
" IX, 14 x 20	7.00
Linden, IC, 14x20	6.50
Merchant's Dipped, IC, 14x20	11.00
Merion, IC, 14x20	6.75
Mint, IC, 14x20	6.00
Newcastle Russia, IC, 14 x 20	7.00
" IX, 14 x 20	9.00
Newcastle Juniati, IC, 14 x 20	6.50
" IX, 14 x 20	8.50
Newcastle Best Coke, IC, 14 x 20	6.00
" " IX, 14 x 20	7.25
Newcastle Coke, IC, 14 x 20	5.50
" " IX, 14 x 20	6.75
Palma Xtra, IC, 14x20	7.25
Phœnix, IC, 14x20	6.25
" IX, 14x20	7.75
Royal, Extra, IC, 14x20	7.00
U. S., IC, 14x20	7.25
Versailles, IC, 14 x 20	5.75
Youghiogheny, IC, 14 x 20	6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20	$7.50
20 x 28	15.00
IX, 14 x 20	8.75
20 x 28	17 50
Pontymister Grade, IC, 14 x 20	6.50
20 x 28	13.00
IX, 14 x 20	7.50
20 x 28	15.00
Worcester Grade, IC, 14 x 20	$5.75
20 x 28	11.50
IX, 14 x 20	6 75
20 x 28	13.50
Dean Grade.—IC, 14 x 20	5.40
20 x 28	10.80
IX, 14 x 20	6.40
20 x 28	12.80
Abercarne Grade.—IC, 14 x 20	5.25
20 x 28	10.50
IX, 14 x 20	6.40
20 x 28	12.80

Imported Bright Plates—

Charcoal.

Duty: 2.2¢ ₩ lb.

Melyn and Cal-land Grade.	IC, 10 x 14	$6.35
" "	IC, 12 x 12	6.60
" "	IC, 14 x 20	6.35
" "	IC, 20 x 28	12.70
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.20
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.85
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
" "	DC, 12½ x 17	5.50
" "	DX, 12½ x 17	6.50

Coke.

Steel Coke.—IC,	10x14, 14x20	5.35
	10x20	8.25
	20x28	11.00
IX,	10x14, 14x20	6.60
B. V. Grade.—IC,	10x14, 14x20	5.40

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)	$13.85
IXX, 14x28..(112 sheets)	14.50
IXX, 14x31..(112 sheets)	16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin	55%
Galvanized	55%

Brass and Copper.—

Standard List ..... 25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks Stove—

Improved Lock Frame, per doz	$15.00
Steel Lock Frame, per doz	18.00
Daisy Improved Pattern, ₩ doz	18.00

Wrought Iron Pipe—

1¼ and under, Plain	60&10&5%
1¼ and under, Galv	50&10&5%
1½ and over, Plain	70&10&5%
1½ and over, Galv	60&10&5%
Boiler Tubes, list Oct. 24, 1892	70&10&5%
Casing, list Nov. 16, 1892	62½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Zinc—

600 lb casks ..... ₩ lb 5½¢
Per lb ..... 6¢

It Is Reported—

Arizona.

That Dawson & Fiske are a new Hardware firm at PHŒNIX.

Florida.

That C. F. Hamblen, ST. AUGUSTINE, has just commenced the erection of a store building adjoining his warehouse which, when completed, will give him about 25,000 square feet of floor space and about 10,000 square feet of shelving.

Georgia.

That the Lowry Hardware Company, ATLANTA, have purchased the Bicycle stock and business of the Nunnally Company.

Illinois.

That G. G. Shearer is about to engage in the Hardware business at MAQUON.

Indiana.

That R. R. Cranmer's Hardware store, at FRANKTON, was destroyed by fire on the 10th inst.

That the Marion Hardware Company, MARION, have been incorporated, with a capital stock of $12,000.

That the safe in the Hardware store of Fishel Bros., HOPE, was blown open and robbed early on the morning of the 12th inst.

Iowa.

That W. D. Rust has recently entered the Hardware business at WEBSTER CITY.

Maine.

That the firm of Stickney & Wiggin, Stove dealers, BELFAST, have been dissolved, Mr. Stickney having bought out his partner. The business will be continued by Mr. Stickney alone.

Minnesota.

That Huntington Bros. are a new Hardware firm at LUVERNE. C. E. and G. L. Huntington are the members of the firm.

That Hunt A. Wyer has purchased the stock of Joseph Helm, Hardware merchant, at RED LAKE FALLS. The price paid was $5000.

That George Wolheter's Hardware store, at ALBERT LEA, was damaged by fire on the 31st ult. to the extent of $1500.

That thieves broke into the Hardware store of Fuller & Denning, PARK RAPIDS, on the 3d inst. and stole about $75 worth of Guns, Revolvers, Knives, &c

New York.

That the Hardware store of E. E Parker, AKRON, was burglarized on the 8th inst.; $100 worth of Knives, Revolvers and Razors were taken.

Ohio.

That burglars visited the Hardware establishment of J. S. Abbott, at 115 South High street, COLUMBUS, on the 11th inst. and carried off about $150 worth of goods.

That C. Smith, formerly with Carter & Huckins, Hardware merchants, of OBERLIN, has removed to Belleville, where he has opened a Hardware store.

South Dakota.

That Booth Bros., MITCHELL, have disposed of their stock of Hardware to W. J. Healey. The new proprietor is referred to as one of the most energetic and capable business men in the vicinity.

Texas.

That Sutton & Sharp's Hardware store, at GEORGETOWN, was robbed on the 30th ult.

That the firm of Ragsdale, McKinney & Co., BONHAM, have sold their Hardware business to Chas. and Frank Davis and James Biggs, who will continue it under the firm name of Chas. Davis & Co.

That W. L. Vicker & Co.'s Hardware store, at WICHITA FALLS, was burglarized on the 5th inst., a lot of Razors and Guns being taken.

Price-Lists, Circulars, &c.

ONEIDA COMMUNITY, Kenwood, N. Y.: "How to Catch Wolves with the Newhouse Wolf Trap." A catalogue with illustrations of Traps describes what are referred to as the latest and most successful methods of catching wolves, as practiced by the professional trappers of the North American continent.

THE PHOSPHOR-BRONZE SMELTING COMPANY, 2200 Washington avenue, Philadelphia: "List of Current Qualities of Elephant Brand Phosphor-Bronze Alloys." The purposes for which the various grades are best adapted are described, and other particulars given which make the list valuable for reference.

TELEGRAM CYCLE MFG. COMPANY, Milwaukee, Wis.: Telegram Bicycles and Sanger racers. A catalogue shows Telegram machines in full roadsters, light roadsters and ladies' wheel; also the Lightning Messenger and Special Sanger racer.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, June 30, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Mechanical Ventilation.

This term has been adopted to distinguish ventilation effected by the use of ventilating fan wheels, &c., from that obtained by the direct application of heat to or in ventilating flues. There are two general ways in which the latter is accomplished: A flue may be heated from the outside—an example is a metal ventilating flue run up through a smokestack—or the inside of a flue may be heated by steam or hot water coils or other appliances. In any and all the variations of apparatus employed to effect circulation in flues, except in rare cases where fans, &c., may be driven by water or wind power, heat must be expended to produce the result; and even in such cases the exception is apparent rather than real, since all power derived from natural sources is drawn from stores of energy depending for supply upon the heat of the sun. Strictly and scientifically speaking, therefore, all ventilation is mechanical; that is to say, it involves the production of motion in air currents by the use of previously confined forces, and the store of such forces drawn upon is so generally contained in fuel that the latter need only to be considered in estimating the economy of different systems.

Economy and Efficiency.

But economy cannot alone be a controlling element in any system of ventilation. Efficiency and certainty also demand careful consideration. No matter how cheap any system may be, if it cannot be relied upon to give ample ventilation under all the conditions imposed upon it in its working it remains a defective system. The whole question between what are called "mechanical" and "natural" ventilation simmers down to this: In which of these two methods can a given required degree of efficiency and certainty be obtained with least first cost and current expenditure? Now since the degree of these qualities required for different buildings may and does vary greatly, the answer to the question can be the same only when the requirements are similar. There is no dispute that a system of natural ventilation possessing sufficient certainty and efficiency for average dwellings can be had for less cost than mechanical ventilation. But between the nearly minimum requirements for home ventilation and the maximum demanded for large hospitals and schools there is a long range of intermediate wants; and for those the question must be decided with special reference to each particular set of requirements. It is only in the extreme cases named that the question may be considered as definitely and finally settled.

Heating Calculations.

There exists a certain form of reciprocity, a kind of give and take, in all scientific calculation, and thus in the art of heating we find that as one body gives up its heat another absorbs it, and as heat is transformed into work in the movement of air so is the work done under certain conditions transformed again into heat. The fact that we cannot calculate more accurately the results to be secured by the introduction of some given device or by the mere supply of a given volume of air at a stated temperature, is not due to any lack of direct knowledge of the laws governing the flow of fluids, the transmission of heat and the like, but rather to the important influence of the material, the porosity, the conductivity and the specific heat of building walls, floors, and ceilings. While the data required for accurate calculation may be amplified and greater certainty assured, yet in the nature of things there will always be a great difference existing even in construction by different parties, but under the same specifications; so great, in fact, that absolute accuracy can never be attained, although the approximation may be very close. There is, however, a certain field of calculation in heating work with which every man in the business should be reasonably well acquainted. It is desirable, for instance, to know the volume of the thermal unit, to know how to calculate the increase in temperature of a given volume of air if heated by the condensation of a given weight of steam, to know what is meant by the latent heat of steam and of what importance this latent heat must be in a steam heating system. Even an approximate knowledge regarding the total number of heat units in a pound of good coal and the number required for the evaporation of a pound of water at a given temperature may be of marked service in arming oneself against the declarations of the man with a coal saving compound that according to his figures of water evaporated per pound of coal would make efficiency of the coal somewhat above the maximum of 100 per cent. Doubtless some of the most disastrous failures in the line of heating and ventilation have occurred, not so much through absolute ignorance, as on account of the total disregard of simple and well-known methods of calculation whereby the results of the experiment could have been accurately and definitely determined.

The commencement exercises of the departments of fine arts, domestic science, science and technology (which includes the trade school), commerce, &c., of the Pratt Institute, Brooklyn, were held on Friday evening, June 22. The great hall of the institute was crowded by the graduates and their friends, who listened with attention to excellent and helpful addresses by Mrs. Ellen H. Richards of the Boston Institute of Technology, Hamilton W. Mabie of New York, and Charles M. Pratt, chairman of the Board of Trustees. Mrs. Richards gave a thoughtful address on the American home, speaking of the improved hygienic conditions of the modern home and the great influence of the Pratt Institute in this direction. Mr. Mabie's address was devoted to the subject of education, and the value of a thorough training in life. Diplomas were conferred upon the graduates of the various departments, after which the students held an informal reception in their several class rooms, the trade school building being particularly well filled with visitors, who admired the samples of the work of the 1893-94 classes there displayed.

The *Plumber and Decorator* of London remarks that in the ventilation of churches and school houses and public buildings generally, a very common mistake is made. Those in charge frequently fail to open all the windows immediately after the buildings have been vacated. The exhalations from the lungs and the emanations from the body, being light, will float for a while in the atmosphere before falling to the floor, and if the windows be opened at once, so that a current of air can cross the hall, many of them will be carried out. If, however, as is usually the case, the windows are not opened for some hours, may be not till the next day, these particles, settling upon the floor, are not carried away, but when the hall is again occupied are by the feet thrown up into the atmosphere and inhaled by the lungs, from which they had been exhaled the day before.

THE LETTER BOX.

Water Heating from Low Pressure Steam.

From J. B. C., *New York.*—I would like to know if a low pressure boiler (pressure 10 pounds) such as is used in heating flat houses in this city, could be employed in heating a hot water boiler of 600 gallons capacity, with a coil of one to five, and heat a maximum of 450 gallons per hour, or an average of 250 gallons per hour, or what should be the minimum of pressure of steam to heat such a boiler. I have noticed flat houses having passenger elevator where the hot water boiler was heated with the exhaust of pumps, they having also connection with the live steam, to be used when the passenger elevator was not running. I have also seen exhaust steam used in the heating system of a flat. Please let me know what is the approximate pressure from the average steam pump for passenger elevator.

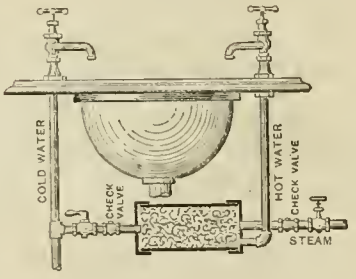
Answer.—Our correspondent's query is so indefinite that in replying to it several assumptions must be made. He does not say whether the steam boiler is to be employed entirely for heating a hot water boiler of the capacity named, or whether it is also to be used for heating the building. In answering his inquiry we shall assume that the heating boiler is required, at least in cold weather, to perform the double duty of heating the building and the amount of water specified. First, the ability of the heating boiler to perform the double duty will depend upon its steaming capacity. Under the assumption that 600 gallons of water are to be heated to a temperature of 212° F., the weight of water to be heated per hour will be 5003 4 pounds. Assuming also that the temperature of this water as fed to the hot water boiler in extreme weather will be 40°, there will be required 860,-584.8 heat units to raise the water to a temperature of 212°. This amount of heat would be obtained by the condensation of 890.6 pounds of steam. To heat 450 gallons would require the condensation of 668 pounds of steam within a small fraction. To heat 250 gallons would require the condensation of 371 pounds of steam. The first named condensation per hour represents the steaming capacity of a 30 horse-power boiler. The second condensation represents the capacity per hour of a 22 horse-power boiler. The third condensation is equal to the amount of steam that could be generated per hour by a 12 horse power boiler. This estimate is based on an evaporative power of 30 pounds of water per horse-power per hour, and the supposition that the water fed to the steam boiler from the returns is not cooled after condensation to a temperature less than 178.5° F. It will be seen that if it should require, say, a 20 horse-power boiler to heat the building, that to heat in addition 250 gallons of water per hour, taken from the mains at a temperature of 40° F., would require a total horse-power of 32. Probably the back pressure in using exhaust steam for heating, whether from steam pumps or other non-condensing engine, will average in good general practice about 4 pounds. Steam exhausted at this pressure is substantially as fit for heating purposes, whether of air space or of water in tanks, as if it were generated in a low pressure boiler expressly for heating. If steam for heating the building and for heating a tank be supplied from a low pressure boiler there is no difficulty in so arranging apparatus as to effect a return of condensed water to the boiler by the action of gravity alone. If the primary boiler be used for the three purposes of supplying power for elevators or dynamos, for heating the building and for heating a tank to supply hot water to occupants, it will be necessary to employ pumps, traps or steam loops to effect the return. The mistake is sometimes made of supposing that because the exhaust from a steam engine can be used advantageously for heating purposes, the same effect could be obtained by drawing steam from the returns of a heating plant. This can only be done by employing a sufficiently large boiler to heat both the building and the tank. Even then it would not be the best way to draw steam from the return main. The correct plan is to take live steam from the boiler or from the steam main for heating the tank, and return the condensed water from the coil in the tank in the same manner as it is returned from the radiators.

Choked Water Backs.

From W. F., *Hoquiam, Wash.*—I have been looking over some of the replies to the inquiry of "E. J. Y.," Regina, N. W. T., that appeared in *The Metal Worker* of May 19, concerning choked water backs, and I find that the one from "E. S. M.," Westminster, Md., in *The Metal Worker* of June 2, very nearly hits the mark. I have had quite an experience with water backs on the Pacific Coast, and in some cases they would choke up in no time, but to overcome the difficulty the only thing required is to construct the water back so that the water circulating through it will not get hot enough to boil. In case of any trouble like that mentioned, I have either increased the size of the pipe used or decreased the number of pipes in the coil, so that the water in the pipes and boiler would never come to a boiling point. This plan fixed the matter for good every time.

A Method of Heating Water.

From T. O. H., *Terra Haute, Ind.*—I send herewith a sketch which shows how hot water was secured at a wash basin in a building in which there was no hot water system. A branch was taken from the pipe that carried cold water to the cold water faucet and run to one end of a chamber, which was filled with pebble stones. At the other end of the chamber two connections were made, one to receive steam, as there was a power plant in the building from which steam at any time could be secured; the other to convey hot water to the hot water faucet at the wash basin. Check valves were placed in the steam pipe and in the cold water pipe



A Method of Heating Water.

on each side of the chamber to prevent water passing down the steam pipe when the steam pressure was not as strong as the water pressure and to prevent the steam from holding the water supply back when the steam pressure was the stronger of the two. The pebble stones were placed in the chamber to prevent the steam making a direct passage to the hot water supply pipe. The satisfaction derived from this arrangement may truly be said to be variable, but is sufficient for the purpose for which it was intended. Thinking that this contrivance might be of interest to the readers of *The Metal Worker* I have sent it in, and have no doubt that many other readers of the paper come across just such interesting novelties in their practice as this, and I trust they will return the favor which I think I am contributing by sending in letters and sketches of what they find.

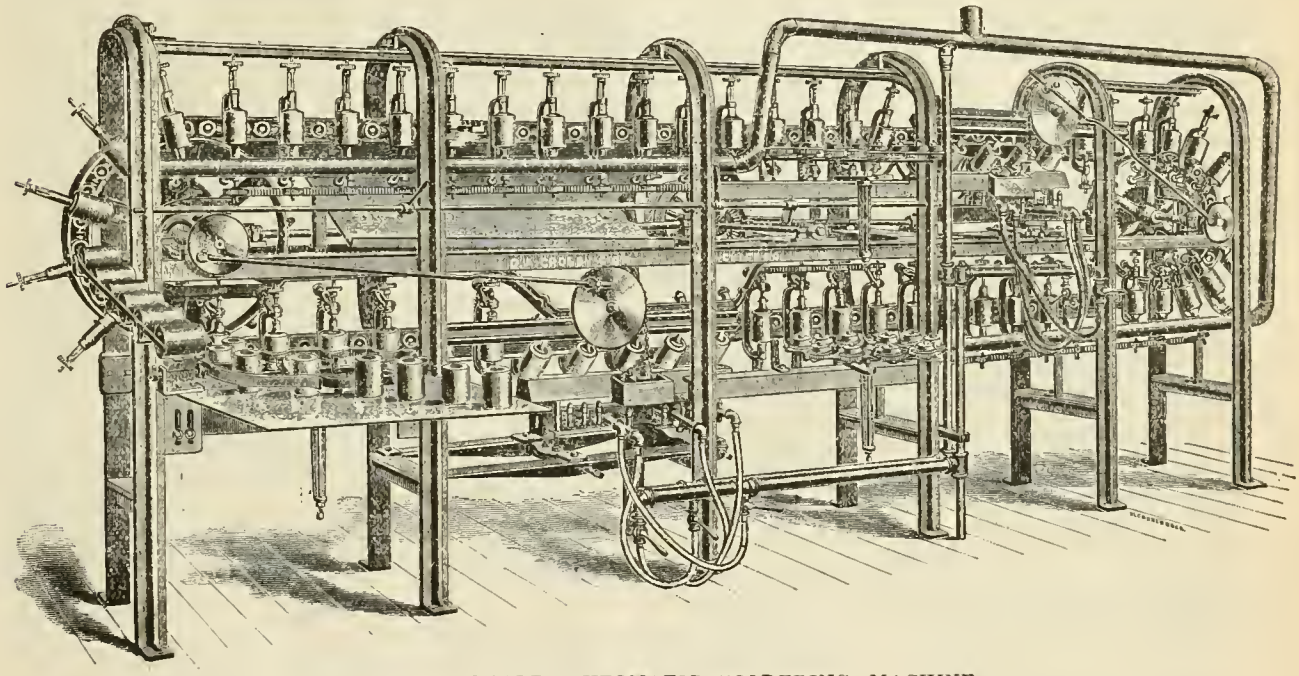
Heating from Furnace Coils.

From CÆSAR, *Louisville.*—The subject of heating from furnace coils is a very difficult one to handle. In regard to coil in a furnace for the heating of one or two rooms at a distance I would say that I have always steered clear of such adjustments whenever and wherever they have bobbed up, for the following reason, which I think will cover a majority of cases: It is impossible to adjust the proper amount of water necessary to the heating of one or two rooms to the body of fuel necessary to heat the balance of the building with-

out constructing a cumbersome and illy balanced job. In cases where it was impossible to reach the rooms with warm air, I resort to the combination plan and heat the lower floor with warm air and the upper floors with hot water or steam. By this plan I obviate all of the trouble resultant from the coil practice. Another reason is that I have never seen a building yet that could not be heated with warm air if the owner would pay the price. A combination can be balanced perfectly and if placed by a competent man the results are always satisfactory. I do not care to enter into an argument on this question, viewing it from the standpoint that I do that the majority of such attempts are failures, and I think that a close investigation will bear me out in the premises.

The Crosby-McDonald Automatic Soldering Machine.

This machine, intended for the use of can manufacturers, is manufactured by G. A. Crosby & Co., 176 and 178 South Clinton street, Chicago. It has been subjected to very thorough and even severe tests, from which it has emerged with most flattering results. An illustration of the machine is presented herewith.



THE CROSBY-McDONALD AUTOMATIC SOLDERING MACHINE.

It is designed to solder both tops and bottoms of round cans on to the bodies, this being accomplished and the can wiped, cooled and automatically discharged from the machine without handling. For heating the solder either gas, gasoline or kerosene may be used as the manufacturer prefers.

The cans are carried by a feeding device from the feeding table to the chucks, where they are automatically centered and clamped. As the chucks containing the cans are carried forward they assume an inclined position, and one end of the can is rolled through a bath of molten solder, the bath being of sufficient length to allow a 3-pound fruit can to be revolved therein about four times. As the can emerges from the bath the carrier brings it again to an upright position and it passes by an automatic wiper, which removes all surplus solder and dross, leaving the metal perfectly clean and bright. The can is then carried past a length of perforated pipe, through which a blast of cold air is forced, causing the solder to cool and set before it passes around the end of the machine, where it is reversed and the other end subjected to exactly the same process as above described, after which the cans are automatically discharged from the machine into whatever receptacle is provided for them.

The cans are revolved from the instant they are clamped in the chucks until they leave the machine, thus allowing the solder to settle evenly and soak well in between the burr of the ends and the bodies. The solder bath is adjustable in all directions so that it may accommodate various hights and diameters of cans. The solder is not melted in the same bath through which the cans revolve, but in an adjoining bath, from whence the molten solder is introduced into the soldering bath by an automatic feed. This insures an even temperature in the soldering bath, as the molten metal is not cooled by the addition of new solder; and, as exactly the same amount is fed in that the cans in their passage take away, the solder is always at the same hight in the bath. Two boys are required to operate the machine, which thus attended will solder the tops and bottoms on to from 35,000 to 40,000 cans in ten hours' time.

The machine is constructed in the best manner. All gears are cut and all wearing surfaces are fitted with the utmost accuracy. Each of the several can carriers runs upon a separate and independent set of trucks, thus reducing friction to a minimum. The machine occupies a floor space 4 x 20 feet and stands 4 feet in hight. The firm state that they have several of these machines in operation in some of the largest packing establishments of the United States.

Prospects in the building trade of Philadelphia appear to be hopeful, if recent reports from that city are reliable. The Philadelphia *Record* announces that Frank H. Rhodes will build 138 houses on Opal and Garnet streets; that John S. Serrill has plans under consideration for the erection of 120 houses on Lehigh avenue; that T. B. Roberts has already started work upon 163 in Twenty-ninth and Master streets, and that James and Charles Maguire have concluded negotiations for a site on which to build 80 dwellings. On the whole, the good building record of 1893 is likely to be eclipsed in the Quaker City this year, if all these plans materialize.

A Boston Passenger Station.

The new Union Passenger Station at Boston of the Fitchburg and Boston & Maine Railroads possesses several noteworthy features, especially in relation to its train shed, and for its heating and lighting system. These are described by a local paper as follows: Twenty-three tracks had to be covered, and to accommodate them a train shed 540 feet long and 472 feet wide has been built. Part of this is an old shed, the new portions consisting of eight spans covering two tracks each, and one span covering a single track. This structure is built of 1500 tons of steel and glass, the latter having an area of nearly 4 acres, and is supported on 128 columns. The lighting and heating apparatus form one of the largest isolated plants in the country. There are 12 125 horse-power boilers, of which six furnish steam at 80 pounds pressure for heating, and six supply the engines with steam at 125 pounds. Instead of building a high chimney, the draft for the boilers is furnished by two powerful steam fans, 11 feet in diameter. Two air compressors for the interlocking apparatus, a number of pumps, five 200 horse-power and one 100 horse-power Westinghouse engines make up the power plant. The electric apparatus comprises two 125-volt, 125 kilowatt generators for operating the draw bridges and turn tables, one 220-volt, 62-kilowatt generator for the electric elevators, one 7½ kilowatt generator to charge the storage batteries for the switches and signals, and two alternating machines for supplying lights at distant points.

A bill to allow cities to furnish electric current for heating has been passed by the Massachusetts House of Representatives.

STEAM AND HOT WATER.

Convention of Master Fitters.

In last week's *Metal Worker* we presented nearly the complete report of the convention of the Master Steam and Hot Water Fitters of the United States. At the time of going to press, however, they were in final session. We present below a note of what was done at the close.

The convention met in executive session shortly after 3 o'clock Friday afternoon, but about 4 o'clock went into open session. It was announced that arrangements had been made for a meeting on July 18 next between a committee of manufacturers of valves and flanges and the chairman of the Committee on Standard Flanges. At this session A. B. Franklin of Boston read a paper on the value of the National Association. A paper was likewise presented by John B. Farnsworth, entitled "Early Reminiscences in Hot Water Heating."

Appropriate resolutions upon the deaths of the following members of the association were adopted, and it was ordered that engrossed copies be sent to the families of the deceased: Herman Kroeschell, Chicago; Hazen Mooers, Milwaukee; J. Lincoln, Jr., Chicago; G. W. Strong, Joliet; William Costello, South Boston.

The convention then adjourned to meet at 9 o'clock Saturday morning, but at this final session nothing was done except that a formal adjournment was taken until the next annual convention.

Types of Heating Boilers in the United States.*

BY ARTHUR C. WALWORTH.

It is not within the scope of a paper of this character and length to enter into history to any great extent, yet it will not be amiss to take a glance backward and notice the development and separation of the several types of heating boilers in use to-day.

In the first half of the century there were few boilers in use for heating purposes only; most of the boilers used for power were of the long two-flue variety, with occasionally a hog nose, a marine or a locomotive boiler, and where steam was used for heating mills, &c., as it sometimes was through large cast iron pipes, it was taken from such boilers. There were, however, a few Perkins coil boilers in use in dwelling houses, which had been introduced by Walworth & Nason between 1840 and 1850, some of which are still in use, and whose type is preserved in the Baker car heater, and there were also some English saddle boilers used in greenhouses, connected to 4-inch cast iron hot water pipes.

AMERICAN INNOVATIONS.

To an increasing demand for steam and water heating, the inventive American mind was quick to respond with improvements and extensions of these primitive appliances: the multitubular horizontal boiler displaced the old two-flue boiler, cast iron was introduced as a material for low pressure boilers, the sectional principle was made prominent as an element of safety, and the thousand and one useful appliances and attachments were devised, so that the approved heating boiler of to day is not only a thing of beauty but an admirable and ingenious piece of mechanism, adapted, so far as human ingenuity can devise, to the peculiar and exacting demands which are constantly made upon it by people who seem to ask nothing short of a thinking and a reasoning automaton.

The system of heating water in a coiled pipe was an attractive one to inventors, and for the last 40 years we find that pipes have been bent and coiled and stacked over, under and around fire boxes in every conceivable manner; box coils, trombones, spirals, gridirons, bird cages and many other forms have been tried; some have worked well and some ill, but those that survive are of the simpler type, the more complex ones having been cast aside, both on account of the mechanical difficulties of their construction and their obstruction to free circulation. For boilers where compression into the smallest bulk is essential or very high pressures are required, this type stands at the head as represented to-day by the Roberts, Almy or Herreshoff boiler. For steam heating apparatus such boilers are not so often required; but for hot water circulators they have a wide field of usefulness from the large amount of surface which can be compressed into the space assigned to a house heater.

At this point it should be stated that since any steam boiler can be used as a hot water boiler, and any hot water boiler may be made a steam boiler by adding a steam drum, I have not separated steam and hot water boilers in the general classification, as that would be an artificial rather than a real distinction.

The use of coil boilers naturally led to the invention of the water tube boiler, which is simply a fire tube boiler with its elements reversed.

Walworth & Nason were making such boilers before 1849, with tubes standing at an angle of about 20° from the horizontal, whether of Mr. Nason's invention or adaptation I do not know.

This type of boiler proved strong and economical, although somewhat expensive, its leading representations to-day being the Babcock & Wilcox, Root, &c. The several makes of water tube boilers came to the front at the Philadelphia exposition of 1876, where careful tests were made of their evaporative capacity with very favorable results, and many of the best house heating boilers to-day are built upon their lines.

Horizontal water tubes suggested vertical water tubes, and this type to day is possibly the most popular for house heating boilers, of which there are many exemplars, both with open tubes and drop tubes, which will be considered later under their respective headings.

THE SADDLE BOILER.

One of the most prolific parent types was the English saddle boiler mentioned above: this was a welded wrought iron boiler, shaped like an inverted U or saddle, with a grate under it. This boiler was often used in greenhouses, and was so wasteful of fuel that a brick or tile flue was usually carried the whole length of the house under the cutting bench to utilize the waste heat. Our American boiler men substituted cast iron for wrought iron, closed in the ends, put a fire door in the front, and we had an old fashioned greenhouse boiler. This was still wasteful of fuel owing to its small fire surface, and improvements were made by using extended surface, corrugations or ribs on the inside, and also by adding internal smoke flues, down drafts, and other devices until this type of boiler has been made most useful for hot water apparatus not under head; these boilers I have classified as fire box tanks.

Another form of fire box tank was evolved from the tea kettle, by raising the fire up into the center of the kettle: to these again internal surface was added for the sake of economy either by extended surface as by Scollay, or by internal water boxes as by Weathered, or by a coil as by Mahony. This class of boiler is simple, cheap and useful for small dwellings, greenhouses, baptisteries, &c., and is often used in its simplest form of a ring of water around a fire pot, making what is usually called a fire box stove.

CAST IRON BOILERS.

From the water tube boiler was evolved in easy sequence the cast iron sectional safety boiler. In using a material like cast iron for a boiler it was evident that for purposes of safety each boiler must be subdivided into a series of small units. Geo. B. Brayton of Providence, R. I.—so he wrote to John H. Mills—made a cast iron sectional boiler, bolted together with faced joints, at Westerly, R. I., in 1849, but it was 1864 before the type was practically introduced, this boiler being apparently the pioneer of the numerous horizontal cast iron boilers with vertical strata. In 1859 Mr. Gold patented a boiler of this kind bound together with three string bolts. A suit brought by H. B. Smith & Co. against J. A. Ingalls & Co. (now Ingalls & Kendricken) throws some light on the history of this kind of string bolt boiler. The defendants were the successors of T. S. Clogston & Co., and were making the Clogston boiler, a cast iron string bolter. They proved in court that Joseph Nason was making in 1855 a cast iron boiler with short horizontal water tubes entering a vertical tube for each section, and the sections being united into a boiler by a string bolt through a water ring at the ends of the vertical tubes. They also proved from the French patent records that one Onesiphore Pecquer patented in France a boiler of this type in 1825. As a result they gained their suit, and the string bolt sectional boiler was open to the world.

Some time before this the Exeter Machine Works had bought Brayton's patterns and patents, and were making the so-called Exeter boiler, which still maintains its high reputation in this group.

In 1870 E. C. Clay of Boston devised a cast iron sectional boiler for dwellings and greenhouses, using instead of faced surfaces two horizontal drums to which the sections were connected by lock nut nipples, and it was at this time also that Mr. Mills was developing his boiler at Walworth's foundry at Cambridgeport, Mass. He also adopted the lock nut screwed connection after discarding the faced joint and the right and left nipple, being the first, I think, to use it in this kind of boiler. It proved popular and was adopted by the Exeter people, J. A. Ingalls & Co., H. B. Smith & Co. and others for large boilers of this type.

Sectional boilers with vertical sections readily suggested vertical boilers with horizontal sections, originating the cheese cake style of boiler, which has been made in such large numbers and seems to be the predominant type of small house boiler.

In 1874 the Canadians were using a great deal of hot water apparatus and importing many English boilers, and this naturally caused them to invent and build boilers of their own, which proved better than the imported ones. About this time Rogers & King of Moutreal began to build the Spence, a square layer boiler named after the foreman. Mr. Gurney of Toronto, a stove founder of business capacity and ability, was the first to improve and push these buckwheat cake heaters as a commercial enterprise, and by combining a good heater with judicious advertising, he has placed thousands of them throughout the United States. They seem to be an evolution of the square Stafford and Spence heaters above mentioned. These pancake boilers are, like their horizontal cousins, either string bolted, like the Gurney, or nippled, like the New Winchester and Hub, and their name is legion.

* Presented at the New York Convention of the Master Steam and Hot Water Fitters' Association of the United States, June 19-21, 1894.

BOILER CATALOGUES.

Most makers of house boilers issue well gotten up circulars or pamphlets describing their boilers in detail. These are sometimes elaborate and handsome books with cuts of boilers, both assembled and detached. If complete they give tables of the data of the different sized boilers, such as number and size of tubes, outside dimensions of boiler, size of smoke pipe, tapping of outlets, square feet of grate and amount of boiler surface. Also a column of number of square feet of direct or indirect surface that the boiler is supposed to carry—that is, the rating of the boiler. In the competition of an open market this is inevitably high, as the maker must rate his boiler as his competitors do theirs—at what it can do and not at its duty under every day average and sometimes unfavorable conditions. The safest way for the heating engineer to determine the size he needs is to estimate the amount of water his apparatus will condense per hour, the only true gauge of its requirements, and allow 1 square foot of grate for every 60 pounds of water condensed per hour, which means a coal consumption of 6 to 8 pounds per hour. And for good economy I claim that a boiler should have not less than 35 square feet of boiler surface for each foot of grate surface, and this surface should be real and not nominal. The above ratings will give from 170 to 200 square feet of direct surface per square foot of grate, but for boilers of larger size this will be of course a larger figure, but depending invariably on the evaporative power of the boiler. I find that hot water boilers are more apt to be overrated than steam, as there is no standard temperature for hot water apparatus. I myself prefer a boiler that can carry the water to 212° or higher, and this means very nearly a steam rating, and in any case I do not think a hot water boiler should be rated more than 25 or 30 per cent. higher than the same size used for steam, yet 50 per cent. is perhaps the more common practice.

BOILER CLASSIFICATION.

I submit herewith a classification of the various boilers and types, genera, species and sub-species, from which, if it were worth while, a table of analysis could be made from the appended boiler lists, so that a person finding a boiler without a name could analyze it and bring it home to its maker in a few minutes. Of course some boilers are hard to place, as they are crosses between two species, like a mule, and my placing them in a certain category may be questioned, but I have arranged the boilers according to their salient points, and submit my lists as the first classification made so far as I am aware.

Analysis Table of Heating Boilers.

						Example.
The original tea kettle	Water subdivided..	Direct passages.....	Water tubes.....	Horizontal.....	Ends of tubes closed	Nason
					Ends of tubes open	Root
				Vertical.....	Open tubes	Mouat
					Drop tubes	Furman
			Cast iron, variform	Horizontal boilers....	Packed joints	Gold
					Screwed joints	Clogston
				Vertical.....	Packed joints	Gurney
					Screwed joints	Hub
		Serpentine passages			Bent coils	Baker heater
					Coils made with fittings	Garth
	Smoke subdivided..	Horizontal tubular			Tubes in one series	Allen
					Tubes in several series	Vogt
		Vertical tubular....			Tubes in one series	Regular
					Tubes in several series	G. K. Paul
		Locomotive				Monarch
	Water and smoke massed	Single.....	Fire box tubes.....		Plain surface	Crawford
					Added surface	Hitchings
			Water stoves			Little Giant
		Complex.....			Concentric rings	Pequot
					Cylinders with loops	Steads

WATER TUBE BOILERS.

Taking the boilers in the order of the analysis we have, first, the horizontal water tube boilers. The high economy of these boilers arises from the large amount of surface that can be placed in a given space by using a square or rectangle instead of a circle, and the element of safety becomes more important as modern engineering demands higher and higher initial pressures. For steam heating this point is not essential, but this kind of boiler has been adopted by the New York Heating Company for their central stations, where they supply steam for both heating and power. In all water tube boilers the weight of water is small in proportion to the duty; and this is advantageous, or the contrary, according to conditions. The hight required for setting these boilers often forbids their use as heating boilers, where they must be placed in basements; and their surfaces are not so easily kept clean as those of the ordinary tubular boiler, as it is evident that the inside of a tube is more easily brushed or blown clean than the outside.

The vertical water tube boilers have the same advantages as the horizontal, with the additional one of not accumulating soot and ashes on their tubes by gravity. In order to be economical, however, some of these boilers, like the Firmenich, require a great hight to obtain a proper length of tube. The drop flue boilers seem to be the best adapted of the vertical water tubes for small heating apparatus, and in the last few years this style has been adopted by many makers, some of them changing from other forms. They permit the concentration of a large amount of surface directly over the fire, and the tubes may be termed self cleaning, as an occasional brushing removes the few ashes that adhere to the vertical surface. The principle is an old one for steam boilers, and Mr. Nason made small house boilers on this plan before 1870. It has been claimed that drop flues will not circulate freely and will collect sediment. But practice shows that this objection is not valid. The Silsby Mfg. Company, who have made drop flue steam boilers for many years, write to the Bolton Heating Company that there is no trouble about rapid circulation, and that the tubes ought to last 20 years or more in a house boiler. As the circulation will take lead shot out of the bottom of the tube there is no danger of sediment collecting, and the makers of the Button boiler tell me that they find the bottom of their loops actually polished on the inside by the rapid current. A disadvantage of these boilers is that they are not easily emptied of water, but this is an infrequent demand, as heating boilers in summer should be filled to the safety valve rather than emptied.

CAST IRON BOILERS.

Next in order come the cast iron boilers. Cast iron is not a material that commends itself to the mechanical engineer for boilers, since in them all strains are those of extension, which cast iron is comparatively weak to resist. American ingenuity has evolved notwithstanding, by the use of this material, a large class of boilers which have been especially successful for steam heating purposes where high pressures are not essential, while by subdividing spaces and using proper thickness of metal they are made safe against explosion and not especially liable to break down. The use of castings instead of sheet metal or tubes enables the maker to depart from rectilinear forms and employs every combination of curves, arches, spheres, bends and corrugations, resulting in an almost infinite variety of detail, some good and some bad.

The horizontal boilers have been most popular for plants of 10 to 50 horse-power, and the vertical or smaller ones of 1 to 15 horse-power. The horizontal may be subdivided into the screwed connections and packed connections, either of which is good, if well made. These sectional boilers can be carried piecemeal into many places where a boiler in one piece could not be got; they also help out the heating engineer when he is short of length but has plenty of width. Almost all these boilers are short of steam space and liable to lift water if forced beyond their fair rating, but for hot water boilers they are especially useful, as their vertical circulation aids the circulation of the apparatus and their life is apparently longer than that of a wrought iron hot water boiler.

All boilers of this class need especial care in cleaning; they are full of corners and pockets where soot and ashes collect, and are with difficulty swept clean either with a brush or a steam jet. It may also be added that a freeze is sure destruction to any cast iron boiler.

Much of the above applies to the cheese cake cast iron boilers with horizontal sections. These boilers are usually provided with cleaning doors for spaces between layers, which must be constantly used, as each layer is a flat shelf for dust to collect upon. Fortunately by using numerous layers these boilers obtain a large amount of bottom and vertical surface, and do not depend on this shelf surface, which is apparently of little value unless swept every day.

Almost all these boilers would gain by using more sections, thus increasing the ratio of surface to grate but without increasing in proportion the cost of the boilers. Most of these boilers have water fire boxes, which is an essential point for a house boiler, as when a fire is covered up for the night and the drafts closed it gives out little heat, except radially in a horizontal direction. In order not to dull the fire at the edges they also have usually fire brick lining or alternate fire brick and iron. Some of these boilers are without outside jackets of non-conducting material and would be improved by such addition.

COIL BOILERS.

There are two conditions that lead an engineer to seek a coil boiler. One is where he needs a strong, light, small and simple affair, and can use a circular or conical coil like a Baker heater, and the other is where he is assigned neither length, width, nor hight and must pack many hundred feet of boiler surface into a few cubic feet; then he can use to advantage, as in some office building where basement space is worth $100 a square foot, a boiler like the Perkins or Almy. Of course such boilers must have steam separating space and enough of it, or they will lift water with great facility; neither can they be used except with pure or purified water, as a small amount of scale will destroy them. They are, however, economical of fuel and perfectly safe, being, as stated before, adaptable to the lightest pressures demanded in steam engineering. They should be run by an experienced fireman, with his eye on the water line, for the lower tubes once emptied they become red hot and bulge down into the fire box in a very few minutes.

TUBULAR AND OTHER BOILERS.

Next comes the old, reliable multitubular horizontal boiler, whose merits and weaknesses, whatever they are, are known to every engineer, and for all around heating plants it is to-day the most popular boiler made and I think justly so. It is of strong form, low cost, easily cleaned, easily repaired by any boiler maker, is loaded with no patent royalties, and when it blows up goes "all at once and no part first." I

Horizontal or Inclined Open Water Tubes.

Abendroth & Root	Root's	New York City.
Acme Boiler & Radiator Co	Acme	St. Paul, Minn.
Babcock & Wilcox Co	Water Tube	New York City.
Chapman, H. M	Chapman's Combine	Chicago.
Chicago Auto. Boiler Co	Chicago Auto	Chicago.
Campbell & Zell	Zell	Baltimore, Md.
Copper Manifold Water Feeder Co	Copper Manifold	Cleveland, O.
Cross, A. T	Saunders	Providence, R. I.
Eastman Steam Heating Co	Eastman	Rockland, Mass.
Electric Boiler Co	Electric	Rochester, N. Y.
Gill, John L., Jr	Gill Patent	Philadelphia.
Harrisburg Boiler & Mfg. Co	Star	Harrisburg, Pa.
Hayes & Falls	Torrent	Rochester, N. Y.
Heine Safety Boiler Co	Heine	St. Louis, Mo.
Lewis Boiler Co	Lewis	Exeter, N. H., and Boston.
Lortie, F	Prefontaine	Granville, Wash. Co., N. Y.
National W. T. Boiler Co	National	New Brunswick, N. J.
Portsmouth Mach. Co	Carman's	Portsmouth, N. H.
Rutzler, E	Blake's	New York City.
Sawyer, N. F	Sawyer	Haverhill, Mass.
Schuylkill F'dry & Mach. Works	Wood's	Conshohocken, Pa.
Shackleton	Shackleton	Not now made.
Smith & Winchester	Winchester	Boston.
Steel, Geo. P., Iron Co	New Amer. Safety	Philadelphia.
Whitworth Heating Co	Whitworth	Worcester, Mass.

Vertical Water Tubes.

Anderson-Asire Co	Asire	South Bend, Ind.
Aultman & Taylor Mach. Co	Cahall	Mansfield, O.
Baker & Shevlin	B. & S	Saratoga, N. Y.
Brake, A	Brake's	Toronto, Ont.
Culver, J. E	Thermostatic	Jersey City, N. J.
Duplex Safety Boiler Co	Duplex	New York City.
Finlayson, A. W	Finlayson	Detroit, Mich.
Firmenich, J. G. & F	Firmenich	Buffalo, N. Y.
Fowle, A. H	Champion	Newark, N. J.
Head's Iron Foundry	Little Giant	Utica, N. Y.
Herbert, M. E., Heater Co	Herbert Down Draft	Chicago, Ill.
Hopson & Chapin	Pequot Vertical	New London, Conn.
Ideal Heater Co	Phelp's Ideal	Oskaloosa, Iowa.
Malcolm, R. J	Malcolm's	Milwaukee, Wis.
Mouat Heater Works	Mouat	Detroit, Mich.
Otis Bros. & Co	Water Tube	New York City.
Peteler Furnace Co	Peteler	Minneapolis, Minn.
Rice Engine & Boiler Co	Triumph	Chicago.
Richardson & Morgan Co	Cyclone	New York City.
Richmond Stove Co	Richmond Victor	Norwich, Conn.
Silsby Mfg. Co	Comfort	Seneca Falls, N. Y.
Smith Patent Boiler Co	Smith Patent	Baltimore, Md.
Susquehanna S. Heater & Mfg. Co	Sperl	Susquehanna, Pa.
U. S. Heater Co	Capitol	Detroit, Mich.
Walworth Mfg. Co	Howard	Boston.

Locomotive Type.

Bruce, F. E	Mehring	Chicago.
Fitzgibbons, P	Water Tube	Oswego, N. Y.
McAleenan & Co	Monarch	Peoria, Ill.
Thatcher Furnace Co	Champion	Newark, N. J.

Tanks with Outside Loops.

At one time by Asheroft	Economical	Boston.
Crane, Geo. A	Crane	Cleveland, O.
Central Falls S. H. Co	Ramsbottom	Central Falls, R. I.
Clonbrock Steam Boiler Works	Morrin Climax	Brooklyn, N. Y.
Snyder, W. B	Snyder	New York City.
Stead, J. C	Spiral	Brooklyn, N. Y.

Vertical Fire Tubes.

Allen, D. N	Allen	Concord, N. H.
Allis, E. P	Reynolds	Milwaukee, Wis.
Baker, Smith & Co	Portable	New York City.
Barron Steam Heating Co	B—Perfection	New York City.
Barron Steam Heating Co	Ruskin, H. W	New York City.
Barron Steam Heating Co	Simplex	New York City.
Barron Steam Heating Co	Stanley, F. T	New York City.
Bates, E. P	Bates	New York and Syracuse.
Benjamin, J. C	His Own	Bridgeport, Conn.
Complete Combination Co	Post & Sawyer	Boston.
Connery, J. W	Connery	Philadelphia.
Davis, A. D	Davis	Colorado Springs, Col.
Denslow & Jackson	Combination	
Dunning, W. B	Dunning	Geneva, N. Y.
Duplex Steam Heater Co	American	New York City.
Ellis, C. R	Ellis	New York City.
Eureka Steam Heating Co	Eureka	Rochester, N. Y.
Ferguson Boiler Co	Ferguson	Albany, N. Y.
Frey & Motter	Surface Burner	York, Pa.
Globe Steam Heater Co	Globe	North Wales, Pa.
Gorton & Lidgerwood Co	Gorton	New York City.
Henderson, J. C., & Co	Henderson	Troy, N. Y.
Hobbs, Gordon & Co	Concord	Concord, N. H.
LeBosquet Bros	LeBosquet	Boston, Mass.
McGinness, Smith & Co	Submerged Tubes	Pittsburgh, Pa.
Mitchell, John	Combustion Chamber	Louisville, Ky.
Mott, J. L., Iron Works	Demarest's	New York City.
Mt. Joy Steam Heating Co	Lindemuth	Mt. Joy, Pa.
Patterson, H., & Co	American Double	Albany, N. Y.
Pierce Steam Heating Co	Excelsior	Buffalo, N. Y.
Ranton Boiler Co	Ranton's	Syracuse, N. Y.
Raymond Furnace Co	Raymond	New York City.
Rutzler, E	Nonpareil	New York City.
Silsby Mfg. Co	Silsby's Steel	Seneca Falls, N. Y.
Silsby Mfg. Co	Comfort	Seneca Falls, N. Y.
Swamscot Mach. Co	Swamscot	Boston, Mass.
Trimble & Lutz	Thermo	Wheeling, W. Va.
Utica Steam Gauge Co	Woods	Utica, N. Y.
Vail, S. S	Reversible	Keokuk, Iowa.
Victor Heating Co	Victor	Norwich, Conn.
Western Engine Co	Bronson	Painted Post, N. Y.

Horizontal Boilers with Vertical Sections, Screwed Connections.

American Boiler Co	Advance	New York City.
American Boiler Co	American	New York City.
Basshor, T. C., & Co	Lydie	Baltimore.
Boynton Furnace Co	Boynton	New York City.
Combination Flue Boiler Co	Comb. Flue	Milwaukee, Wis.
Exeter Machine Works	Exeter	Exeter, N. H.
Foster, F. W	Improved	Boston, Mass.
Gates, E. N., Heating Co	Columbian	Fitchburg, Mass.
Gurney Heater Mfg. Co	Double Crown	Boston, Mass.
Hart & Crouse	Royal	Chicago, Ill.
Smith, H. B., Co	Gold's Improved	Westfield, Mass.
Smith, H. B., Co	I X L	Westfield, Mass.
Smith, H. B., Co	Mercer	Westfield, Mass.
Smith, H. B., Co	Mills	Westfield, Mass.
Smith, H. B., Co	O. K	Westfield, Mass.

Horizontal Fire Tubes.

Broomell Schmidt	Our Own	York, Pa.
Devine, Peter	The Flat Top	Chicago.
McCormack, J. H	McCormack	Wallingford, Conn.
McNeil, J. C	McNeil	Akron, O.
Parmelee, E. S	Side Flue	Wallingford, Conn.
Standard Car Heating Co	Westinghouse	Pittsburgh, Pa.
Vogt, Henry, & Bros. Mfg. Co	Vogt's	Brooklyn, N. Y.
Worcester Steam Boiler Works	Allen	Worcester, Mass.

Horizontal Water Bars in Strata.

American Boiler Co	Perfect	New York City.
Carmody, J. D	New Idea	Evansville, Ind.
Geyser Heater Co	Geyser	Rochester, N. Y.
Majestic Mfg. Co	Majestic	St. Louis, Mo.
McLain, J. H., Co	Cambridge	Canton, O.
Mott, J. L., Iron Works	Sunray	New York City.
Walker & Pratt Mfg. Co	Commonwealth	Boston.
Wilber Heater Co	Wilber	Chicago.

Vertical Boilers with Horizontal Layers.

Abendroth Bros	Andrus	New York City.
American Boiler Co	Florida	New York City.
American Boiler Co	Soleil	New York City.
American Boiler Co	Spence	New York City.
American Boiler Co	Tropic	New York City.
Boyce, A	Boyce	St. Louis.
Brown, S. E., Heating Co	Blodgett	Chicago.
Clark, Ansel	Avery	Norwich, Conn.
Columbian Construction Co	Smith	Minneapolis, Minn.
Gates, E. N	New Hot Water	Fitchburg, Mass.
Gold, E. E., & Co	Pulsifer	New York City.
Ideal Boiler Co	Ideal	Chicago.
Lincoln H. W. & Steam Heat. Co	Superior	Central Falls, R. I.
Longard Bros	Lougard	Halifax, N. S.
McLain Co., J. H	Humber and Harvard	Canton, O.
Model Heating Co	Novelty	Philadelphia.
Mulford Heater Co	Mulford	Galva, Ill.
Page, Wm. H., Boiler Co	Volunteer	Norwich, Conn.
Pease, J. F., Furnace Co	Pease	Syracuse, N. Y.
Pulsifer, F. H	Auburn	Auburn, N. Y.
Putnam Foundry & Mach. Co	Plummer	Putnam, Conn.
Redman & Byram	R. & B	Fishkill Landing, N. Y.
Robb, John	Monarch	Akron, O.
St. Louis H. W. Heating Co	St. Louis	St. Louis.
Smith & Anthony Stove Co	Hub	Boston.
Smith, H. B., Co	Globe	Westfield, Mass.
Steel, Geo. P., Iron Co	Monitor	Philadelphia.
Stover Heater Co	Cuba Vertical	Freeport, Ill.
Wheeler, Russell, & Son	Palace King	Utica, N. Y.

Horizontal Tubes Closed at One End.

Althaus, F. D	Sectional	New York City.
American Heater Co	America	Beloit, Wis.
Bailey & Baldwin	Novelty	Pottstown, Pa.
Boynton Furnace Co	House Warmer	New York City.
Brown, R. F	Unique	Chicago.
Co-operative Foundry Co	Bermuda	Rochester, N. Y.
Hazleton Boiler Co	Porcupine	New York City.
Hedges, S. P	Hedges	Greenport, N. Y.
Holland & Thompson Mfg. Co	Holland	St. Paul, Minn.
King, H., & Son	King	Corry, Pa.
McLain, J. H., Co	Cambridge	Canton, O.
Nason Mfg. Co	Free End	New York City.
Rohn & Ellicott	Rohn	Easton, Pa.
Vertical Tube Boiler	Tube Boiler	Long Island City, N. Y.
Walworth Mfg. Co	Clay	Boston.
Wilson Boiler Co	Wilson	Buffalo, N. Y.

Perkins Type.

Almy Water Tube Boiler Co	Almy	Providence, R. I.
Dimmick & Smith Mfg. Co	D. & S	Wilkes-Barre, Pa.
Ducolin, S	Ducolin	Norwood, St. Lawrence Co., N. Y.
Finlayson, A. W	Finlayson	Detroit, Mich.
Garth, Chas., & Co	Garth	Montreal, P. Q.
Gifford, S. J., & Co	Park	New Bedford.
McLellan, Chas. T	Little Wonder	Easton, Pa.
Roberts, Edward	Roberts	New York City.
Walworth Cons. & Supply Co	Perkins	Boston.

Concentric Rings.

Bell, Geo. H., & Co	Peerless	New York City.
Canton Mfg. Co	Columbia	Canton, O.
Herbert, M. E	Herbert	St. Joseph, Mo.
Haxton S. Heater Co	Haxton	Kenawee, Ill.
Hopson & Chapin Mfg. Co	Pequot Vertical	New London, Conn.
Nolan, W. E	Nolan's	Brooklyn, N. Y.
Royal S. Heater Co	Royal	Gardner, Mass.
Rubel & Co	New Lily	Chicago.
Wheeler, Cyrus, Jr	Wheeler	Auburn, N. Y.

Fire Box Tanks.

American Boiler Co	Modern	New York City.
Brown, Rufus G	Brown	Waltham, Mass.
Caswell, F. K., & Co	Forced Circulator	Hartford, Conn.
Combination Co	All Right	Norwich, Conn.
Duplex Steam Heater Co	Duplex, Auto	New York City.
Ellis, Chas. R	Small Ellis	New York City.
Fish, Hindle	Smith & Lynch	Boston.
Gorton & Lidgerwood Co	Old Style Gorton	New York City.
Hay & Prentice	Pattern L	Chicago, Ill.
Hitchings & Co	Corrugated	New York City.
Hitchings & Co	Vertical B. B	New York City.
Leader, Putoam		Putnam, Conn.
Lovegrove & Co	Schimpf	Philadelphia.
Mahony, M	Direct	Troy, N. Y.
Mahony, M	Return Flue	Troy, N. Y.
March-Brownback Stove Co	Crown	Pottstown, Pa.

McDonald, K.	McDonald	Portland, Maine.
New Haven Steam Heating Co.	Old Style	New Haven, Conn.
Pentecost Steam Heating Co.	Pentecost	Worcester, Mass.
Putnam Foundry & Machine Co.		Putnam, Conn.
Scollay, John A.	Scollay, H. W.	Brooklyn, N. Y.
Smith, H. B., Co.	Cottage	Westfield, Mass.
Thayer Heater Co.	Thayer	Wollaston, Mass.
U. S. Heater Co.	Mascot	Detroit, Mich.
Vanderman, Wm.	Vanderman	Willimantic, Conn.
Walker & Pratt Mfg. Co.	Cranford	Boston.
Ware Auto. Heat Gen. & Reg. Co.	Ware	Philadelphia.
Weathered, T. W.	Weathered	New York City.

Gold Type.

Carr, E. T.	Carr	Miles City, Mont.
Eureka Steam Heating Co.	Plaxton	Rochester, N. Y.
Jewett, S. S., & Co.	Expert	Buffalo, N. Y.
Smith, H. B., & Co.	Gold	Westfield, Mass.
Steel, G. P. Iron Co.	Excelsior	Philadelphia.
Stover Heater Co.	Cuba Horizontal	Freeport, Ill.
U. S. Heater Co.	Capitol, H. W.	Detroit, Mich.
U. S. Heater Co.	Hecla, Steam	Detroit, Mich.

Circular Coil Boilers.

Annin & Co.	Moore's	Brooklyn, N. Y.
Auto. Safety B. & Eng. Co.	Trowbridge	New Haven, Conn.
Baker, Smith & Co.	Car Heater	New York City.
Brock, A. D.	Brock's	Bostol.
Catchpole, A.	Catchpole	Geneva, N. Y.
Clapp, M. R.	Coiled Tube	Hudson, N. Y.
Gurnee, P. G.	Gurnee	Kingston, N. Y.
Herreshoff Bros.	Herreshoff	Bristol, R. I.
Mahony, M.	Mahony	Troy, N. Y.
McKay, Alex.	Peter Smith	Detroit, Mich.
N. Y. S. Heater Co.		New York City.
Portland Heater Co.	Portland	Portland, Me.
Simmons, John	Burkhard	New York City.
Springfield Coil Boiler Co.	Springfield	Springfield, Mass.
Tobey, Wm. L.	Tobey	East Boston, Mass.
Union Brass Mfg. Co.	Searle	Chicago.
Ward, Charles.	Ward's	Charleston, W. Va.
Whitlock Coil Pipe Co.	American, H. W.	Elmwood, Conn.

Furnaces with Water Surface Supplementary.

Boynton Furnace Co.	New Gas Light	New York City.
Brown, R. F.	Water Heater	Chicago.
Denny Bros. & Co.	McKay Comb.	Newark, N. J.
Fuller & Warren Co.	F. & W.	Troy, N. Y.
Hart & Crouse	Prince Royal	Utica, N. Y.
Howard Furnace Co.	Combination	Syracuse, N. Y.
McDonald, T. A., & Co.	Combination	New York City.
Norcross Damper Reg. Co.	Combination	Boston.
Orr, Painter & Co.	Torrid Sunshine	Reading, Pa.
Pease, J. F., Furnace Co.	Economy	Syracuse.
Russell, Daniel	Russell's	Boston.
Rutzler, E.	Combination	New York City.
Simonds Mfg. Co.	Culver	New York City.

Hot Water Stores.

American Boiler Co.	Little Giant	New York City.
American Boiler Co.	Small Perfect	New York City.
Comb. Stove & Water Heating Co.	Brewer	New York City.
Goulds & Caldwell Co.	Caldwell	Chicago.
Hitchings & Co.	Domestic	New York City.
Herendeen Mfg. Co.	Furman, Jr.	Geneva, N. Y.
Ingram, W. H.	H. W. Stove	Philadelphia.
Kearns Wro't Steel Range Co.	Kearns	Philadelphia.
Lynch & Woodward	Foxboro	Boston.
Mahony, M.	Cooper, with coil	Troy, N. Y.
McLain, J. H., Co.	Yale and Sandow	Canton, O.
Rex Heating Co.	Rex	Norwich.
Rice Boiler & Engine Co.	Triumph	Chicago.
Smith & Anthony	Water Stove	Boston.
Walker & Pratt Mfg. Co.	Small Series	Boston.
Wilks, S., Mfg. Co.	Wilks C. Stove	Chicago.

Drop Flue Boilers.

American Boiler Co.	Bolton	New York City.
Button Boiler Co.	Button	Waterford, N. Y.
Head's Iron Foundry	Standard	Utica, N. Y.
Herendeen Mfg. Co.	Furman	Geneva, N. Y.
Johnson, F. T.	Hartford	Hartford, Conn.
LeBosquet Brothers	New LeBosquet	Boston.
McLaughlin, G. T., & Co.	Drop Tube	Boston.
Nason Mfg. Co.	Equator, S.	New York City.
Nason Mfg. Co.	Gulf Stream, H. W.	New York City.
Raymond & Campbell Mfg. Co.	Sun	Middletown, Pa.
Remington Mach. Co.	Remington	Wilmington, Del.
Soleau, E. R.	Soleau's	Newark, N. J.
Windsor Heater Co.	Windsor	Galena, Ill.

Unclassified.

Dover Fdry. & Mach. Co.	Challenge	Dover, N. H.
Joy Steam Heating Co.	Joy Stanton	Titusville, Pa.
Stanton, Henry	Harrison	Flushing, O.
Stanton, Henry	Galloway	Flushing, O.

do not think, however, that there is a case on record where such a boiler, being used for heating purposes and the main supply valve kept open, has exploded. With a properly proportioned apparatus you will find it very difficult to get up over 15 pounds steam pressure on the gauge, while with 80,000 pounds tensile strength steel a 48-inch boiler with ⅜-inch shell figures 1250 pounds per square inch bursting pressure, or using 5 for factor of safety 250 pounds, which would seem a safe margin beyond all peradventure.

The regular vertical tubular boiler is not much used as a heating boiler, one great objection being that its vertical tubes are not easily brushed either from the fire box or from the smoke bonnet; nor are such boilers economical, owing to the short length of tube that is submerged, usually only five-eighths of the whole length. They also have a very hot smoke bonnet when forced and have often set on fire the ceiling over them where it has not been fire proofed. This type has been modified, however, and, the above objections being removed, makes an excellent house boiler. Mr. LeBosquet obviated the latter objection by adding a superheating chamber over the tubes and under the bonnet, and J. K. Paul and others have added more surface by additional tubes with reversed draft and by other devices, so that the boiler has been made as economical as others of its class and cost. A very simple and fairly good boiler with vertical tubes is made by a plain cylinder full of tubes set on end on a brick fire box, and if brick setting is also used the outside skin of the boiler may be utilized for boiler surface; this boiler is hard to beat for low cost.

Locomotive boilers are not much used for steam heating. They are rather too expensive, for one thing. They are, however, a first-class boiler in a wood burning region, perhaps the best adapted to burning wood of any of the types. The writer has also used them in large dwelling houses in Maine and New Hampshire, setting the whole boiler under the heating stack and utilizing the outside as heating surface, the same as the Gold boiler is often used.

The fire box tank—that is, a fire box in the inside of a water box—is mostly used for greenhouse boilers where the head of water is only a few feet, as a cast iron box is not a safe thing to put internal pressure on. It is safe to say that these boilers are not economical unless additional heating surface is obtained by various devices, and the makers recognize this fact by making such additions, yet the best of them do not have a proper proportion of surface per square foot of grate. In their simplest form as a water stove they are very useful for laundries, stables, &c., but these little stoves can hardly be considered heating boilers.

The serious defect about all these boilers is that the main body is all one casting, and a small crack or defect when developed destroys the entire boiler.

There are two other types of boilers that should be mentioned before closing the list. One has alternate concentric rings of water and of smoke, and is really a vertical tubular boiler, the shell itself being one large tube and the other tubes being concentric inside it. If made of cast iron this would seem to be a weak form of construction, but will answer if shells are made thick enough. The other peculiar type is a vertical cylinder with surface added by water tubes leaving the cylinder and returning to it either by rectangles, by short loops or long coils. These boilers seem to reverse the usual principle of putting the fire inside the boiler and put the boiler inside the fire. To be economical it is evident that the outside must be very thoroughly insulated with a non-conducting covering.

BOILER ATTACHMENTS.

Leaving the boilers with this sketchy analysis, we should consider before closing their appendages and attachments. The most important of these is the grate.

A vast amount of ingenuity and invention has been expended upon the grates of the house heating boilers, and the manufacturers have profited by the experience of the furnace makers, which is often their own, and produced a large variety of oscillating, rocking, shaking, vibrating, dumping, revolving, and otherwise performing grates which would seem to leave little to be added in that direction. So, too, many boilers have clinker doors just above the grate, which are very useful. The makers universally furnish a water gauge and two or three gauge cocks, and usually a gauge cock box or water cock column, a steam gauge and a diaphragm regulator for controlling the draft, usually arranged to open and close dampers, both at ash pit and chimney, or to open and check draft in latter. For this top smoke connection I am inclined to think that a damper set by hand with a check draft operated by the automatic regulator the best combination. Hot water boilers do not carry with them an automatic regulator, but there are a number of good devices to be found in the market if demanded. A hot water boiler, however, is so different in its action from a steam boiler that it can be satisfactorily regulated without an automatic attachment.

A most marked improvement has been made in the last ten years in the external style and decoration of small boilers. As an example, ten years ago the Gurney was homely enough to scare a mule and its *confrères* were not much ahead of it in beauty. To-day, by the aid of tasteful pattern making, decorative handles, dampers and attachments and a little nickel plate and fresh paint, the house boiler captivates the purchaser at first sight, while artist and poet have been called in to ply their pencil and pen for the advertising literature of the enterprising makers. So have the dictionary and gazetteer been searched for catching appellatives for these children of American ingenuity, and captious must be the man or woman who, disregarding everything else, cannot find a name to suit them. A man can break himself with a Brake boiler or get broke with a Broke, or instead of a mother-in-law he can have a Torrent, a Geyser or a Cyclone in his house; so he can choose between the climates of the Equator, the Tropics, Bermuda, Cuba, Florida, the Gulf Stream or Hecla. If a sun worshiper he can select the Sun, the Sunray, the Soleil or the Torrid Sunshine. If a monarchist he can have a Majestic, a Monarch, or a Royal Palace King and Prince Royal, while an enthusiastic American can buy a National, American, Columbia or Commonwealth, while the sporty man can keep a Champion, Victor or Mascot in the house. At any rate, any one can have both Comfort and Perfection if he so wish.

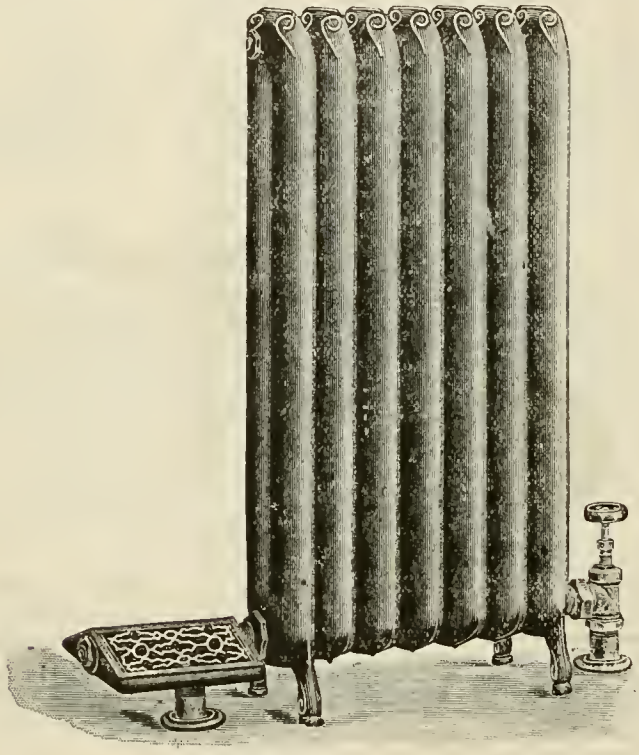
Leaving out the quotation marks this last statement is not far from true to-day, and the American house boiler takes its place by the side of those other necessities of our civilization, the harvester, the sewing machine and the typewriter, as the tribute of American brains to the comfort and convenience of our civilization.

"HEALTH and Comfort in the Home Circle" is the captivating title of a pamphlet just brought out by Thomas W. Weathered's Sons, 244 Canal street, New York. The pamphlet is of oblong shape bound in paper and in a prefatory note dated June, 1894, the company thank their patrons for the favors extended heretofore, and advise them that the Weathered boiler will always be reliable and that they will guarantee it to do all that is claimed for it. On opening the catalogue proper there are found illustrations, general and sectional, of the various boilers made by this well-known concern. First is the double dome, then come their No. 2 and 3 improved boilers. Later illustrations are given of the grates of the single dome boilers and of their self-feed hot water boilers; also their No. 2 combination laundry range. Other illustrations show the method of heating

water for baths, and accompanying the illustrations are given full descriptions and particulars. At the end of the pamphlet are presented a number of flattering testimonials.

The America Foot Warmer.

In the accompanying illustration we show the application of what is known as the America Foot Warmer to a steam or hot water radiator. The foot warmer is being introduced to the trade by the America Heating Company of Rockford, Ill., who state that the device is inexpensive, occupies but little space, is easily attached to a new or an old apparatus and may be connected to either end of a radiator. When used with a steam radiator having a single pipe system the warmer may be attached to the unconnected end, a stand resting on the floor supporting the foot warmer from beneath. The goods are finished in several styles, including nickel plate, brass, copper or oxidized copper. The warmer measures 8¼ inches in length and 9 inches in width. The engraving which we present herewith so clearly shows the device that extended description would seem to be unnecessary.



The America Foot Warmer Applied to a Radiator.

HEATING NOTES.

The Novelty Steam Generator is set forth in a circular issued by the Model Heating Company, Philadelphia, Pa. A general view of the heater and views of the various sections and parts are shown in half tone engravings. A brief description of its chief features is presented, and some facts given of a test held May 29, according to which the boiler evaporated 13$\frac{3}{4}$ pounds of water per pound of coal. Another point made for the boiler is that with 800° of temperature in the fire chamber the smoke pipe showed but 190°. The trade will be interested in this apparatus.

Application has been made for a charter of incorporation for the McGinniss-Smith Company of Pittsburgh, which concern propose to manufacture and sell all kinds of steam, hot water and air heating apparatus and ventilating appliances. Wm. K. McGinniss, Robert S. Smith, Jno. A. Langdon and others are the incorporators. The new corporation will succeed the present firm of McGinniss, Smith & Co.

A Western edition of their catalogue of Boynton's furnaces and heaters has been issued by the Boynton Furnace Company, 207 and 209 Water street, New York, and 195 and 197 Lake street, Chicago. This catalogue comprises 32 pages and treats of Boynton's patent hot water house warming heater, in 17 sizes, for burning hard or soft coal or wood; Boynton's patent cast iron low pressure steam heater, in 14 sizes, also for any kind of fuel; Boynton's new gas tight self-clearing hot air furnace, in five sizes, portable or brick set, for hard or soft coal, with cast iron return flue radiators and with heavy steel plate radiator; the New Climax furnace, for soft coal, in five sizes for brick work, and seven sizes portable; the new steel dome furnace, for either hard or soft coal or wood, in five sizes for brick work and seven sizes portable; the new steel dome return flue furnace with cast fire pot and cast radiator or brick lined fire pot and wrought radiator, for any kind of fuel, in three sizes for brick work and four sizes portable; the New Crusader furnace with heavy wrought radiator or cast iron radiator, for hard and soft coal, in four sizes for brick work and seven sizes portable; the New Niagara furnace with wrought or cast iron radiator, for hard and soft coal, in four sizes; the New Champion wood burning furnace, with 5-foot fire chambers, in four sizes; the Champion Extra wood burning furnace in three sizes; the new steel dome return flue furnace, with water heating combination, for hard or soft coal and easily adapted to wood, in three sizes for brick work and four sizes portable; the New Crusader furnace, with water heating combination, for hard or soft coal, in four sizes; Boynton's Superb fire place heater; Boynton's Baltimore fire place heater; the New Crusader room heater; the Fire King air circulating room heater; Boynton's Newport range in three sizes; the New Danube double oven range in two sizes; the New Lakewood double oven range, and Boynton's Niagara water heater for hard or soft coal or natural gas, in two sizes, for supplying hot water and heating conservatories, small dwellings, &c. The company have also issued a supplementary circular descriptive of their New Niagara low pressure steam boiler, furnished in three sizes.

The Bridgeport Steam Heating Company, Bridgeport, Conn., have increased their capital stock from $10,000 to $20,000.

The Richmond Stove Company, Norwich, Conn., display their usual good taste in the latest catalogue that we have received from them. It is a pamphlet 10 x 8 inches in size, held together by a silk ribbon. The contents are illustrations of the extensive line of Richmond heaters made by this concern, with the names and capacities of the heaters given in connection with the illustrations.

Cost of Electricity.

The *Electrical World* states that in referring recently to some English data on the cost of generating electrical energy in central stations the conclusion was drawn that 6 cents would probably more nearly represent, exclusive of capital charges, the cost per horse-power hour of generating current in the central stations of this country than 4 cents, the figure usually quoted. Commenting upon the report of the Massachusetts Board of Gas and Electric Light Commissioners for 1893, our contemporary says:

Extensive official data and information are given of all the central stations in that State, and while not in a form to be directly applicable to calculations on the entire cost of generating current, yet they will enable approximate results to be arrived at. Almost all of the companies in the State do both arc and incandescent lighting, and some also supply current for motors, which renders it difficult to fix on a rate which will represent the average cost at which electrical energy is sold. The charge for incandescent lighting is almost uniformly 1 cent per 16 c.-p. lamp hour, and it is probable that, as usual, where flat rates are given, they are based upon the same figure; assuming that the prices received for arc current are also based upon incandescent charges, we have 12 cents as the approximate price received per hourly horse-power. This figure would be too high for motor rates, but as that assumed for arc light charges is probably too low in many instances on account of the "scaling down" of current for public arcs, we may assume 12 cents per hourly horse-power as the average received for all electrical energy sold, which, however, will include carbons for arcs and trimming. In looking over the result of the operation of the various stations for the year ending June 30, 1893, we find that of 60 companies 26 did not declare any dividend and six did not earn expenses. Of the 28 companies which paid dividends, 19 paid from 6 to 8½ per cent., the remaining nine paying from 5 to 1 per cent. It will be thus seen that over half of the central stations of Massachusetts found no profit in operating, or, under our assumption, it cost them 12 cents or more to generate an electrical horse-power.

PLUMBING and GAS FITTING.

Philadelphia Trades School Commencement.

On Wednesday evening, June 20, the fourth annual commencement exercises of the Master Builders' Mechanical Trades School were held at the Master Builders' Exchange, Seventh street, Philadelphia. The exhibition rooms of the exchange were lighted up for the inspection of the visitors and the exterior of the building was tastefully decorated in honor of the occasion. The programme was simple, consisting of brief addresses by Franklin M Harris, president of the exchange; George Watson, chairman of the Trades School Committee, and Stacy Reeves, representing the school. Director of Public Works James N. Windrim then addressed the students in an effective speech, in which he said that the time had now passed when America was compelled to draw upon England, France and Germany for their skilled artisans. The American youth, he said, have now learned how to work, which is the best capital for a young man. He has knowledge which cannot be lost in speculation, which will increase to the exact value the workman himself puts upon it. Therefore, he continued, every young artisan should set himself a high standard of excellence in his work. His aim should be to be the first in his chosen occupation, to be the best workman, to be a master workman. He rejoiced that the trades schools of America, under the guidance and teaching of skilled men, are providing workmen from our own people who will be able to compete with the highest skill of the nations of the world.

Following the addresses, the graduates of the several classes were presented with their certificates. The numbers graduating from the different classes were as follows:

Carpentry	14
Bricklaying	6
Stone cutting	2
Blacksmithing	2
Painting	3
Plumbing	19

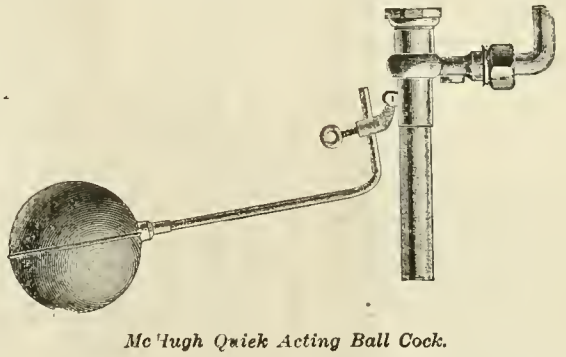
The following are the names of the students who graduated from the plumbing class:

George H. Broehnan.
Claude Ramsbacher, Jr.
William E. Daniell.
Ellis Swann.
Edmund A. A. Schneider.
Thomas Hushen.
James J. O'Hara.
Edmund J. Reidel.
John W. Butler.
George Worrell.
S. J. McCandless.
James S. Ferguson.
John J. Schwartz.
John M. Stemmer.
George W. Duffy.
Thomas J. Malarkey.
Lawrence Hatch.
Samuel E. Draves.
William A. Roberts.

Of these graduates, George H. Broehnan and Claude Ramsbacher, Jr., received prizes of $10 each for special proficiency. The school will commence its fifth session in the fall, when a large attendance of pupils is assured. Its success so far has been remarkable. Graduates from the various branches of trade taught have almost without exception obtained remunerative positions, in which they have done great credit to the training received in the trades school.

McHugh Quick Acting Ball Cock.

The accompanying engraving represents the McHugh quick acting ball cock, recently patented, manufactured by T. J. McHugh, 292 Washington street, Boston, Mass. The device is made of best material and so constructed as to admit a free flow of water when open and to close quickly and tightly by the action of the ball. It gives a full supply until the tank is filled and shuts off, without dribbling or hammering. The manufacturer states that there is no packing to wear out or dry up when water is shut off.



McHugh Quick Acting Ball Cock.

The Knights Initiate.

The Knights of Tabasco assembled in the "ordinary" of the Cadillac on Thursday afternoon to perform their initiating ceremonies. In view of the large number of new members, nearly 100, the following were selected to be initiated in the presence of the rest: Samuel Clark, A. C. Whitney, W. J. B. Lee, J. H. Hamilton, C. H. Meckenbirn and Frank K. Chew of *The Metal Worker* staff.

While the Knights were working on the first candidate, the others, by courtesy of a chambermaid, were released from their confinement in an adjacent room and entered the sanctorum wearing Ideal water closet seats around their necks for regalia. They were quickly secured, ordered to be killed, and confined under guard. The sentence of death was afterward commuted by "Old Pepper" Cushing to an initiation of unparalleled severity, and the good work went on. The "hot stuff" applied approached the temperature of the furnace through which Daniel passed, and every man came out a genuine "hot stuff." "Red and White Pepper" (the secretary) then reported $100 in the "pepper pot" (treasury). Judge C. B. Ernst was then elected attorney extraordinary and counselor plenipotentiary, his salary to be drawn from his own bank account. Resolutions of thanks were adopted to the Hotel Cadillac for the courtesies received; to A. G. Alexander for his splendid entertainment and to the National Association of Master Plumbers for the honors conferred. "Young Pepper" D M. Davidson and "Pepper" F. W. Herendeen were appointed a committee to send to each copies of the resolutions. The meeting then adjourned and the Knights dispersed, singing one of their quaint songs. This unique organization will be heard from in greater strength than ever at Philadelphia next year.

Detroit Manufacturers.

The manufacture of goods that are used by plumbers is an industry in Detroit, Mich., in which a large number of people are employed. A few of those on whom a call was made during the convention are given below.

The Park & McKay Company make a specialty of plumbers' supplies and manufacture a number of specialties, their Utopia siphon water closet being one of their leaders.

The Detroit Lead Pipe & Sheet Lead Works, Detroit, manufacture all weights and sizes of lead and tin pipe and sheet lead. In addition they handle a full line of wrought iron pipe and valves and fittings. They also carry plumbers' tools and supplies and are adding a number of specialties that will interest the plumbers.

The Detroit Sanitary Supply Company, Detroit, Mich., are sending out a neat catalogue of their Clean Sweep non-siphon trap in brass, vented and unvented, in all of the various shapes required for sinks, lavatories, baths and urinals. The same variety is made in lead cast in one piece. They also make a large line of Clean Sweep bath and basin waste and overflow and supply pipes with air chambers. They also make a combined basin overflow and plug combined. Goods made to measurement are one of the features of their business.

Birck & Sherwood Mfg. Company are well known to the trade through their Success seats and tanks for water closets. Their buildings are on the corner of Champlain and Meldrum streets, and form three sides of a square fronting 200 feet on Champlain street and running back 140 feet, with an average width of 50 feet. Inside the square is

their iron and brass foundry, where everything from the hinges for the seats to the brackets for the tanks are made and a line of plunger water closets. Their wood working department occupies the main buildings, with their brass finishing shop. Here is their sheet metal shop, and 300 flush tanks a day, all finished complete, varnished and ready for shipment, gives some idea of their capacity for manufacturing, and seats are turned out with the same rapidity. The quality of their goods is their pride, and nothing inferior in grade is permitted to be shipped. During the convention a lunch was served to the visiting ladies, and afterward a photograph was taken of the ladies arranged on a specially built platform in front of their factory. All of the ladies left their address and will receive pictures later. The Knights of Tabasco also were entertained, and enlivened their visit with recitations and songs. Many of the delegates found time also to visit this hospitable house.

Sales Bros. are a popular house with the local plumbers who need steam fitters' supplies and soil pipe.

The Ideal Mfg. Company, who furnished a reserved seat for all at the Cadillac, have a plant occupying a front of 350 feet in Dubois street and 230 feet on Franklin. Their wood working shops where the Ideal closet seats, flush tanks and bath rims are made, are so arranged that the lumber passes from hand to hand without resting till it reaches the storeroom with a finish like a fine piano. This wood work is protected by a varnish that is so durable that it is said the seats may be suspended in boiling water for 60 seconds without opening a joint. They have an iron foundry with a capacity of 20 tons of iron per day, where they make all their brackets and cast iron goods and steam and hot water boilers for two of their customers. Their core oven is heated by a gasoline burner made by the Union Heater Supply Company and they are much pleased with its economy and efficiency. Their foundry is fitted up with a railway crane that can be used on any floor in the shop. They have a brass foundry where their brass work and the Ideal hot water and steam valves are made. Their engine room is kept in exhibition condition by their master mechanic who runs the plant which furnishes electricity for their lighting and the motors for the various machinery in their plant.

The Union Heater Supply Company make a specialty of gasoline goods. A plumbers' or painters' torch is one of their new things that presents advantages and can be moved quickly without danger of its going out. They make a furnace for melting brass, in which 4 pounds of brass can be melted in ten minutes ; and as it is small, it is adapted for use in pattern and machine shops. Their first catalogue is being prepared and will contain many excellent articles, one of which is a tailors' goose, the heat of which can be nicely regulated.

Samuel Dickson, 79 East Congress street, has a sample room fitted up with plumbing goods that is calculated to make the Detroit property holder wish for similar fixtures in his buildings. Enameled baths, handsome lavatories and a variety of water closets are set for inspection just as they would be in use.

Bowerman & Allen, 141 West Larned street, Detroit, have a number of attractive specialties which they showed to the visiting plumbers.

Method of House Drainage, Disposal of Waste and Ventilation.*

The subject of house drainage has, since a remote day, been the study of not only the master plumbers, but of scientists, architects, engineers and a host of others, resulting in many divergent opinions of more or less practical utility, but of as yet no perfect system meeting fully the great and ever increasing demands which its importance requires.

To the masters plumbers, equally as much or perhaps to a greater extent, is due a large share of the present excellence of our system now in vogue, and probably it is safe to say that nowhere in our broad land has it been exceeded in its present state of perfection than in the "heart of the commonwealth of Massachusetts." Let us for this then give thanks to the master plumber whose earnest endeavors have carried the good work onward in spite of short-sighted opposition which he has met upon every hand ; opposition coming from those whose efforts should have been directed in assisting rather than in opposing.

But to-day, as a triumph to the master plumber, these same parties are being brought to realize that the master plumber is a power, a factor toward the accomplishment of a perfect whole, and he is beginning to receive his due The difficulty of covering so broad a field as the subject demands in so confined a space as this article is, of course, appreciated, but a few words denoting the progress of sanitary house drainage as at present being introduced here may be of interest.

METHODS OF SEWAGE DISPOSAL.

A city of nearly 100,000 inhabitants must of necessity have a very good, bad or indifferent method of sewage disposal. Worcester is especially favored in the former respect, thanks to our far-seeing city fathers, who have designed, planned and executed one of the finest systems in the country. The final disposal of the same is, however, still a disputed question, the method of chemical treatment, resulting in a deposit of solid matter in settling basins, having been introduced at an outlay of thousands of dollars and which is to a certain extent satisfactory for present needs. So much for the taking away and disposal of sewerage. Now for that which interests and affects more vitally the master plumbers.

From an early beginning of cement pipe with open joints and foul odors, with small S traps being constantly siphoned, from no ventilation, and disease spreading water closets, we have a highly improved and almost perfect system of ventilation, the latest sanitary improvements of water closet, lavatory and bath, open and unin closed, affording no opportunity for the accumulation of disease germs or infectious surrounding of rotting wood work. A brief sketch of the arrangements in use here may perhaps be of interest.

While similar in many respects to those which obtain in other cities, it has possibly some features which are local in their application. Beginning with the connection with the sewer, an extension of 10 feet through the cellar wall is first made, properly connected at its outer end with a connecting cement or vitrified pipe to the sewer proper ; this connection being made by a licensed sewer layer, under the direction and superintendence of an engineer furnished by the city. Inside the cellar wall is placed a running iron trap, having on its outer or sewer side a brass clean out, and on its inner or house side a 4-inch iron inlet extending through the outer wall for the admission of fresh air, said air being drawn in by natural circulation caused by the main iron soil pipe receiving the house sewerage being extended to and through the roof of the building. From the above trap the main soil pipe is exteuded across or through the building to points under the fixtures, either above or below ground as the case may be, and thence carried up and through roof as above stated. All iron soil pipe used below ground is extra heavy. Traps of fixtures are back aired. Back air pipes are in size not less than 2 inches and are carried through roof by being increased 4 inches, or may be connected into main soil pipe before placing through roof. The fresh air drawn in at the fresh air inlet before mentioned is constantly circulated through this system of piping, insuring a perfect ventilation and rendering void any danger from escape of gas should an unknown break or defect occur in any part of drainage pipe. After the soil pipe has been put in place it is given a water test under the superintendence of the inspector of plumbing.

LOCAL VENTILATION FROM WATER CLOSETS.

The above gives an outline of our drainage arrangements. Another feature to which especial attention is given is the local ventilation from water closets. All water closets are required to have a special ventilating pipe of either galvanized iron, cast iron or copper running into a heated flue, insuring the carrying away of all foul odors from the closet above the trap. This plan has been successful to a greater or less extent, depending on the distance from the heated flue, number of angles, point of entering flue, &c. It is intended to adopt a new clause in our ordinance demanding that a special brick flue shall be constructed on one side of the house chimney in use for kitchen purposes, but having no connection whatever with said kitchen flue. This flue being constantly warmed by the adjoining chimney has a strong upward draft. Into this flue all local ventilation pipes are entered, of size not less than 2 inches in diameter. No two or more pipes are allowed to be counected, but each must enter separately and independently of each other. Formerly several closets were connected to the same ventilating pipe, said pipe being increased according to the number of closets, and the main pipe finally entering the smoke flue of the kitchen chimney under the roof. It was, however, found that in this case the least draft was at the point of entrance, and the ventilation practically a dead letter.

STYLE OF CLOSET EMPLOYED.

When the intended changes in our ordinance are in working order, it is safe to say that our buildings will be as free from foul odors as it is possible to make them. Regarding the style of closets in use for the better class of work, the siphon has nearly superseded the old style wash out, so many of which were used but a few years since, their defects having driven them from use. The siphon, with its large water seal, freedom from noise and strong action, has recommended itself favorably and is practically satisfactory. Short hoppers and combined hoppers and traps fill the requirements for a cheaper class of work, and although of course not as satisfactory as the siphon, are sanitary and fill the conditions required. The above system will in all probability be introduced into our public schools, the requirements being of such great importance in the question of pure air and freedom from disease among the thousands of children attending our schools. We consider that the principle of a plumbing fixture of any kind is that at once upon its use the foul matter which it contains should be immediately, entirely and effectually carried away. To accomplish this a perfect design of flushing from an adequate supply of water and an equally perfect system of drainage and ventilation are indispensable, and we are proud to claim that our methods have practically accomplished this. Yet we do not stop here. We are continually studying, experimenting and discussing new inventions and improvements and endeavoring to make the plumbing of our city second to none in the country. Our Master Plumbers' Association is furthering the good work by every means in its power. We are alive. We are endeavoring to make our mark, not only for ourselves and the public, but for the good of every association of master plumbers throughout the land, thereby strengthening our National Association, giving it a truly national reputation, that every one of us who are its members may hold up his head with pride and say, I am a member of the National Association of Master Plumbers.

*Essay prepared by the Sanitary Committee of the Master Plumbers' Association of Worcester, Mass., and presented at the Detroit convention of the National Association of Master Plumbers, June 19-21, 1894.

At a recent Irish Trades Congress a resolution was passed urging upon the local authorities in Ireland the desirability of electing practical plumbers to the positions of sanitary and water inspectors. This class of work had been, it was asserted, largely carried out by unskilled and unqualified men. In Glasgow, Bradford, Liverpool and Manchester the inspectors are all plumbers, and several plumbers are acting as inspectors at Belfast, Ireland, with the best results.

The Business End of Plumbing.*

BY C. C. DEWSTOE.

As a mechanical art the plumbing trade has kept pace with the progress and development of the age. As an important branch of the building art it has done more. In its adaptation to the requirements of a perfect house what other branch of building has shown such development? Masonry is substantially the same as it has always been. Carpentry, except for a little more niceness of finish and detail, shows no special improvement. The same may be said of plastering and painting. But contrast the plumbing of a generation ago with that of the building of to-day. Modern plumbing, with its beautiful fixtures, scientifically accurate piping for drainage, ventilation and water supply, involving in a high degree the principles of mechanical and sanitary eogineering, not only performs a function of the highest use and convenience to the house, but marks an epoch in the progress of civilization and refinement. It is not necessary to dwell upon this aspect of our business to men who have aided in its development and perfection, nor is it the theme of this essay to enlarge upon the excellence of plumbing as an art, but rather to inquire why a business showing such progress and improvement, both in quality and quantity, should show up so poorly as a money maker.

That, upon a broad scale, the business of plumbing is not financially successful can easily be demonstrated, if demonstration were required. Look over the records of the mercantile agencies and examine the ratings, if you can find them, of the master plumbers of the country. Ask the banks how they are rated as depositors or customers. Ask the jobbers with how much confidence they establish or increase lines of credit.

True, our friends the newspapers credit us with enormous gains. They crack their jokes, not always fresh or witty, about our diamonds, and oh, how they expatiate upon our bills.

If we could get and hold a fraction of the profits they credit us with we could well afford to smile at their extravagance and could almost forgive them for the universal suspicion their never ending jokes have thrown upon our business.

ENTITLED TO FAIR PROFITS.

I take it that no elaborate argument is needed to show that the plumbing business is entitled to as profitable remuneration as any other of equal magnitude and importance. The only question to discuss is, How shall we get it? The plain answer would seem to be to secure a reasonable profit on all the materials and labor. But this is by no means as easy to do as to state. To conduct a plumbing business successfully and profitably requires higher qualifications and greater business ability than to conduct a purely mercantile business. The merchant buys his goods at the lowest price he can obtain. He marks them at such an advance as will cover upon an average business his expense of living and management and leave a profit. If he sells his goods he makes his profit. There is little or no uncertainty about it. The plumber also buys his goods. But how does he sell them? He must fix the price when he figures his job that he is willing to take for his goods at periods all the way from three months to three years from the time he fixes his prices. He cannot accurately fix the quantity he must furnish, for plans are rarely explicit and clear enough to enable the most experienced to estimate exactly the quantity he must furnish. Further, he must look forward to the time of executing his contract and fix accurately (or suffer for it) the amount and cost of the labor required to complete the sale of his goods.

In addition to these qualifications he must possess the mechanical ability to execute or superintend and lay out the execution of the work itself. Are not these higher qualities than are demanded in the mere buying and selling of merchandise?

And, unfortuuately, is it not true that the difficulty of our trade arises from the fact that a large number of its members do not possess these qualifications? They are good workmen. They possess the mechanical qualifications in a high degree, but the other quite as important business qualifications are in too many cases lacking.

* Essay presented at the Detroit convention of National Association of Master Plumbers, June 19-21, 1894.

It is not to their discredit, but on the contrary immensely to their credit, that journeymen are ambitious to become masters. But are they not apt to overestimate the value of purely mechanical and underestimate the value of the other qualifications required in the management of business?

NEED OF COMMERCIAL ABILITY.

To know how to do the work is a valuable acquirement, but to know how to make the work pay seems to me quite as important, but it is a lesson the best practical man on earth must learn before he can make a success of the business. To make the plumbing business pay there is but one way. To make money out of a job by skinning it, by evading the requirements of good sanitary work and taking advantage of ignorance of architect or customers, will not commend itself to members of the Master Plumbers' Association, nor would they patiently listen to its suggestion. There is but one other way, and that is to weigh carefully the cost of contracts, both material and labor; to estimate carefully what may be called the incidents of the job that may go against you, and to add over all a profit that after allowing for expenses and living will leave a little for a rainy day.

How shall we accomplish this desirable end? It seems to me that it is pre-eminently the field for association work. It must to be successful spring from unity of action. The slow horse fixes the gait for the profession, and the low man largely fixes the rate for contract work.

A better price on contract work would remedy another evil of the trade, and that is the high price charged for day work and extras, and the wrangling, kicking, delay in settlements and general ill feeling resulting. It is hardly to be wondered at or greatly to be blamed if a plumber, feeling that his contracts are paying him nothing, or next to nothing, should seek to recover on work not covered by contract, but much the better and more honorable way to insist upon such a reasonable profit upon contracts that extras and day work could be executed upon substantially the same basis.

The world has not much use for, and does not long regret, the man who all his life works cheap and "lets the town bury him" It does respect the man who insists on a fair profit, who pays his bills, who lives decently, who takes a proper place in the business world and asserts himself as a man, and above all, such a man can respect himself.

Echoes of the Plumbers' Convention.

UNUSUAL INTEREST was taken in the election of officers this year. More than one section had its favorite candidate, whose claims were zealously pressed in every direction from the opening of the convention. A hot contest was therefore expected, but, as has been said of some other matters, in this respect everybody's most sanguine expectations were exceeded. It was the hottest fight ever seen in a convention of the National Association. It was any body's chance until the last ballot. Yet the strength of each candidate was pretty accurately measured by some careful observers before the first ballot was taken. The most remarkable estimate made was that of Paul Redeiske and Alex. W. Murray of Chicago. They estimated within one of Mitchell's vote, and varied only two or three from the votes given to the other candidates. As it was a large convention (309 votes on the first ballot) and there were four strong candidates in the field, it is believed that the guess made in this case was unprecedentedly close.

THE EXCURSION to the Oakland House on Friday was an event. The work of the convention was over, all cares were dismissed from the delegates' minds and they were prepared to enjoy a day's pleasure to the utmost. And it was a pleasant day. The sun shone hot, but the excursion was a trip on the water, and the hotter the weather the better at such a time. The steamer "Pleasure" left the city at 8.45 in the morning with over 1000 persons on board, passed up the Detroit River, through Lake St. Clair, past the St. Clair Flats, with shooting and boating club houses on every hand, into the St. Clair River, and finally brought up at the Oakland House at St. Clair mineral springs at 1.20. Here the passengers debarked and partook of a fish dinner, after which they scattered over the broad porches, haunted shady nooks on the lawn or "tripped the light fantastic" in one of the hotel's spacious parlors. The Knights of Tabasco seized the opportunity to give a few candidates for knighthood a public initiation, which was perhaps enjoyed more by the spectators than by the neophytes. At 4.15 the return trip was begun. Refreshments suitable for a hot day were served lavishly, dancing proceeded on the upper decks with very slight intermissions and everywhere songs were heard with great crowds joining in the choruses. The city was reached at twilight, and the excursionists separated to their hotels with enthusiastic praises of the aquatic and scenic surroundings of Detroit and thanks to the Detroit local committee for their magnificent entertainment.

A PLEASANT FEATURE of the convention, serving greatly to brighten its appearance, was the presentation of a *boutonniere* every morning to every one of the delegates. It was very thoughtful on the part of the local committee, and the favor was highly appreciated by all of the delegates.

THE RETIRING PRESIDENT, Daniel G. Finnerty, and the retiring secretary, David Smith, have the thanks of *The Metal Worker* for their unvarying courtesy. At no time was either the president or the secretary inaccessible or unaproachable. With a multitude of cares on their shoulders and harassed by all sorts of vexations, they might easily have been excused for an occasional failure to respond to a request for some piece of information. But this never happened. They were always genial and obliging. But then how could they be otherwise? They are both Bostonians and both very old subscribers to *The Metal Worker*.

WILLIAM E. CROSBY, whose name does not appear in the list of officers of the association, nevertheless fills an important official function. He is known to the officers and members as executive clerk, has served in that capacity for several years past, and will probably continue to do so for an indefinite period. His is a position which survives changes of administration, and wisely. It is necessary to have some one man to keep the run of the business of this great association, so that the details may slip along smoothly and without friction, leaving the officers free to consider the greater matters of policy for the conduct and maintenance of which the association was founded.

AT THE REQUEST of the delegates who were detained in the convention the Knights of Tabasco on Wednesday afternoon escorted the ladies to the steamer "Sappho," where the delegates found every lady provided with a good seat and delighted with the courtesy of the Knights. At 5 p.m. they proceeded across the Detroit River to the "Ben Hur" farm at Walkerville, Ont., where A. J. Alexander tendered a more sumptuous and delicious repast than any banquet, and served in an orchard; the surroundings were quite novel and romantic. The tables were laden bountifully with both the delicacies and the substantials. Native wines were furnished without stint and claret punch and lemonade for the ladies. After all had been served strolls about the farm were enjoyed. On the sound of the whistle of the steamer for the return the Knights of Tabasco seated host Alexander in a chair and with song carried him to the steamer, making a very happy feature of the occasion. The return trip was enlivened by music by the orchestra, enchanting songs by the Knights, and the only Kelly, Thomas F., entertained all by an exhibition of dancing that for grace and variety of steps surpassed anything seen on the street of Cairo. At 9.30 p.m. the guests departed to their hotels with feelings of warmest enthusiasm over their entertainment, and the Detroit Association as well as Mr. Alexander will long be remembered for their hospitality.

EDWARD H. FOX of Chicago, the Western agent of the Phœnix Glass Company, Pittsburgh, Pa., made a handsome display in Parlor S, Hotel Cadillac, of gas and electric light globes in various colors, shapes and styles of ornamentation.

IN APPRECIATION of the untiring efforts of John Yule to provide a full delegation from New York, to insure comfortable transportation, ample refreshments and

satisfactory seating on the West Shore train, a party of conspirators started a fund with the intention of presenting him with some token of their appreciation. Samuel L. Malcolm, William C. Young and Philip Smith, the committee, secured a handsome Etruscan gold heart locket. One side bordered with a scroll design was set with three diamonds, the other bore this inscription: "John Yule, from New York Delegation M. P. A., Detroit, 1894." At a meeting of the delegation the token was presented by Samuel L. Malcolm with a cordial speech and received by Mr. Yule with such remarks as showed the heart he received was of no truer metal than the one he has always worn.

THE MICHIGAN STATE ASSOCIATION OF MASTER PLUMBERS is a live organization and is laying out some work that will be for the good of all when completed. James Meathe of Detroit and Colonel Wheeler of Kalamazoo are shaping matters to introduce a new law in the next session of the legislature similar to the Massachusetts law printed in *The Metal Worker*, June 16.

BOWERMAN & ALLEN, Detroit, circulated a little blue covered pamphlet of their Unique water closet, giving "four reasons why" all should buy it. On the first cover page they say: "You pull the chain, we do the rest." This should be attractive in some cases.

MARK E. MONASH of the Van Auken Steam Specialty Company, Chicago, pointed to their patent deflecting shield seen on all the raidators in the hotel.

THE PICTURE of "Uncle Josh," circulated by the Park & McKay Company, Detroit, will make their Utopia water closets and seats and cisterns long remembered by all who saw them.

M. T. WHITNEY represented the Raymond Lead Company of Chicago. Yet the weight of his goods neither depressed him nor the many who are glad that they met him.

AS THE PARADE FORMED in front of the Cadillac every plumber and knight was presented with a hard rubber match safe, bearing a horeshoe with the words "Capital Luck" on it, the trade-mark of the United States Heater Company, Detroit, and the names of the Capital, Hecla and Mascot steam and hot water boilers.

A NICKEL PLATED PIN TRAY or ash receiver, bearing the word "Richmond," formed of a peacock with his tail spread, made Parlor N, the headquarters of Thomas J. Douglas, sought alike by the ladies and the gallants. Mr. Douglas represented the Richmond Stove Company, Norwich, Conn., and found little time to talk steam and hot water boilers.

MUCH of the pleasure afforded the visiting ladies is due to the superb management and untiring energy of Mrs. M. L. Comstock, who guided everything so that no friction occurred. Mrs. Comstock is a sister of the Lane Bros., prominent plumbers in the city.

THE SPLENDID NEW TROTTING TRACK that is being completed at Detroit has a kitchen of the most approved style, with carving tables and a mammoth Peninsular steel range The men's toilet room is provided with 24 water closets and 32 urinals arranged to flush in series of eight. This work was done by Lane Bros.

THE IOWA DELEGATION distributed an official directory of the Iowa M. P. A., giving the officers and the members and their address.

C. H. WILLIAMS won all the ladies to the Dunning boilers by presenting them with a souvenir bottle of Lundborg perfumery, with the compliments of the New York Central Iron Works, Geneva, N. Y.

THE ROUSE & HILLS COMPANY, manufacturers of plumbers' goods, at Cleveland, Ohio, could have no more active and genial representative than Geo. E. de Heredia, who was met with a smile whenever he met a plumber.

TRAPS AND VENTS.

IN A RECENT ISSUE of a Baltimore paper a pleasant reference is made to the action of the Henry McShane Mfg. Company of that city in restoring to their employees the 10 per cent. which had been cut from their wages during the past winter. At the time of the reduction many complaints were made and a strike was talked of. Better counsel prevailed, however, and the men are now in a position to congratulate themselves that they did not resort to any violent method.

IN AN ADDRESS on the Progress of the Trade and its Future Development presented by Louis F. Meyer of Milwaukee at the Detroit convention of the National Association of Master Plumbers occurred the following paragraph in reference to the progress of the craft: The trade schools in the East are at least a beginning in that direction and in their limited capacities are doing a noble work for us, but time works wonders and I expect to see the day when the applicant for apprenticeship will be obliged to enter a preparatory school, just as our doctors do now, where they can acquire an insight into the fundamental principles of sanitation before they are allowed to figure as master plumbers.

JOHN HARDIN has opened a new plumbers' supply house at 3883 Cottage Grove avenue, Chicago.

M. REILLY has opened a branch plumbing shop in the room with Rand & Rader, Peru, Ind.

LEIGHTON, DAVENPORT & Co. have purchased the plumbing business of Hiram Norton in Bar Harbor, Maine.

AMONG RECENT INCORPORATIONS at Albany, N. Y., was the Standard Commode and Closet Company, to manufacture water closets and appurtenances in Brooklyn. Capital, $12,000, and directors, D. K. Osbourne and James Simpson of Brooklyn, and George F. Simpson of Montclair, N. J.

THE ITHACA PLUMBING & STEAM HEATING COMPANY, Ithaca, N. Y., is the name of a new firm that have been started by S. J. McKinney and others to do plumbing and steam heating.

E. J. MCNAMARA, formerly of the firm of Westwater & McNamara, Columbus, Ohio, has built at 46 Gay street, that city, a handsome structure for his own gas fitting business. The interior of the building is fitted up most completely, the walls being handsomely papered in pleasing colors. The basement is used as the work and stock room, while the store room proper is above. Here are shown an extended variety of gas and electric light fixtures, chandeliers, clusters, brackets, &c. In the center of the room is a pillar to which all electric lights center, which is surrounded by a circle of electric lights. The walls are arranged for a further display of goods. Besides the articles mentioned Mr. McNamara carries a full line of gas heating and cook stoves adapted for either natural or artificial gas.

IT IS REPORTED that P. A. Costello has opened a plumbing and heating business at Oshkosh, Wis.

WE ARE INDEBTED to Peck Brothers & Co., New Haven, Conn., for a copy of their catalogue of water and gas works goods. This pamphlet is serviceable in shape and size and is published with that neatness and excellence of workmanship that distinguishes the catalogues of this company. There is nothing particularly ornamental about it, but the matter is presented clearly, the illustrations are good and full particulars of sizes, numbers and the necessary information for buyers are presented. The pamphlet, which is bound in pebble cloth, rounded corners, contains 70 odd pages, almost all of which carry several illustrations. In the beginning is an index, which is followed by a complete telegraphic code. The goods illustrated are bibbs, stops, cocks, nipples, couplings, sprinklers, nozzles, hydrant work fittings, &c.

Some American Tin Plates.

We have been favored by the New Castle Steel & Tin Plate Company. New Castle, Pa., with a number of beautiful samples of the tin and terne plates made by them. These are genuine American material in the most rigorous sense of the term, the product from the ore to the finished plate being manufactured at the company's own works. As an illustration of what the American tin plate industry is capable of accomplishing, these plates are remarkable in their excellence of finish and superior qualities. They include IC and IX bright plates of both coke and charcoal finish, and of light and heavy weight, as well as heavily coated "old method" and ordinary terne plates. Each description is excellent, comparing with imported plates of like quality, generally to the advantage of the home product, and evidencing an extraordinary degree of progress for a works that is little more than eight months old. Accompanying the consignment were samples of light plates of No. 38 gauge, coke finish, which are claimed to be the lightest gauge tin plates ever made in America, and, probably, anywhere else. The metal coating of these sheets is evenly distributed, and the plates present a very handsome appearance. It is said to be impossible to tin black sheets of thinner gauge than these, as, in the process of pickling, the acid would eat them into holes. As it is, we understand that the coating of these 38-gauge sheets requires the greatest care in order to prevent this occurrence.

The New Castle Steel & Tin Plate Company's mills are capable of turning out much thinner black sheets than even 38 gauge, as is testified by samples sent to us which are thinner than the paper on which *The Metal Worker* is printed.

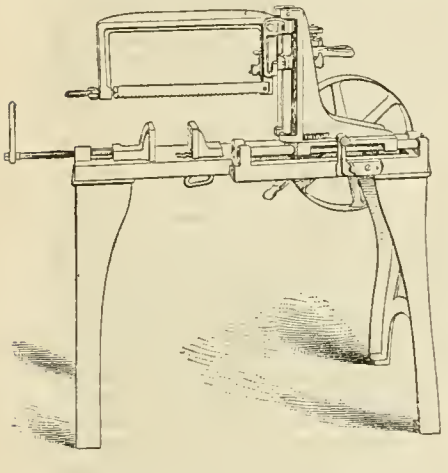
Captain Mahan has informed the Navy Department that the boilers of the "Chicago" have given out, and that it will be necessary for the vessel to remain a month or more at Antwerp for repairs. The "Chicago's" boilers have been in use since the vessel was launched. They will be replaced with new ones when she returns to the United States.

The Halifax, Nova Scotia, Board of Trade has memorialized the Canadian Government for a subsidy to enable the present telegraph cable from that port to Bermuda to be extended to Jamaica and other West Indian islands.

Dr. Senner, the United States Commissioner of Immigration at the port of New York, reports that just as many people left the United States in the steerage as have arrived during the 11 months to May 31 last.

The Q & C Shop Saw.

During recent years there has been a demand for power driven hack saws for cutting metal. Heretofore these machines have been provided with a gravity feed. The machine here illustrated —designed by the Q & C Company of Chicago and New York—has a positive automatic screw feed, and the speed can be instantly changed to accommodate hard or soft metal, large or small size. It will cut all kinds and sizes of metal up to 6 inches in diameter. The cutting speed is always the same. The stroke is horizontal, insuring perfectly square work, while the movable vise permits the entire length of the saw to be used. The machine is provided with an automatic stop. It is stated that this machine will do more work than the usual type, and that the saws will last much longer.



The Q & C Shop Saw.

SCRAP.

We are indebted to Edward Allred, 750 North Illinois street, Indianapolis, Ind., for a photograph of drawings illustrating a new tin plate package, upon which, we understand, he has secured a patent. It is a sheet metal box made with sliding cover and for which special claims of strength and durability are made. It is also claimed to be inexpensive in construction.

It is estimated that the salmon pack on the Columbia River will fall short of that of last year by more than 100,000 cases, owing to the recent floods. The manager of the Pacific Can Company, Astoria, Ore., places the probable decrease in the demand upon the works for cans at about 20 per cent. below the average, on account of the short catch.

Blairsville Rolling Mill & Tin Plate Company, Blairsville, Pa., closed down last week temporarily.

The Pittsburgh Tin Plate Works, New Kensington, Pa., about 20 miles from Pittsburgh, have given a contract to the A. Garrison Foundry Company of Pittsburgh for the erection of a two-mill plant, and when completed will roll their own sheets for tinning purposes instead of buying them as heretofore. The new addition will be so constructed that two additional mills can be added at any time desired.

The Baltimore & Ohio Railroad has obtained a seven years' extension of its control of the Chesapeake & Ohio Canal, and will, it is reported, operate it by electricity.

HEATING and PLUMBING.

NEW WORK AND CONTRACTS.

Jos. E. O'Malley, 215 North Wells street, Chicago, has the contracts for the plumbing, gas fitting and sewerage in the following flat buildings: W. F. & W. E. Ross, Barry and Evanston avenues; P. O'Malley, Erie and Market streets, and A. Modine, 98 Townsend street.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D C., until July 20, for roofing, sheathing, slate and copper work of roof, dome and drain pipes, roof skylights, &c., for the Post Office Building at Worcester, Mass. Drawings and specifications may be obtained at the office of the Supervising Architect, Washington, or from the superintendent at Worcester.

The contract for the plumbing of the new office building now in course of erection on Fifth avenue, Pittsburgh, by the Carnegie Steel Company, Limited, has been let to Weldon & Kelly of that city. It is stated the contract amounts to about $40,000, which makes it one of the largest plumbing contracts ever let in Pittsburgh. There will be 14 separate sets of pipes varying in size from ¾ inch to 8 inches in diameter, extending from the foundation to the top of the building, upward of 240 feet. In all there will be nearly 5 miles of iron pipe, most of which will be double strength. All exposed pipes and fittings will be polished brass and nickel plated. The system of waste and ventilation will be what is known as the Durham system, all the pipes being wrought iron. The water supply from the street will be forced into two immense tanks on the roof by two separate steam pumps, after first passing through a filter and a suction tank in the basement. The water will then be conveyed back to the basement into two large distributing drums, and thence to the various fixtures. Two 350-gallon boilers will provide hot water for lavatories, &c., and return circulation pipes will keep the water constantly warm and ready to be drawn at any of the faucets. On the thirteenth floor the main lavatory will be located and will be notable for elegance of detail. In the sub-basement provision is made for a gymnasium and swimming bath for the exclusive use of the employees of the Carnegie Company. The contractors have begun work and expect to finish by January, 1895. There were nine bidders.

Lee Brothers, Concord, N. H., have been awarded the contract for the plumbing work of the new State library, and will also put the heating system in the National State Capitol Bank, using for the purpose a Gurney hot water heater.

Bids will be received by John S. Noble, City Clerk, Easton, Pa., until July 3 for the heating apparatus for No. 2 Engine House.

The contract for the plumbing of the Clay School building, Fort Wayne, Ind., was awarded to Byron Hattersley.

Sealed proposals will be received by the Board of New City Hall Comsioners, San Francisco, Cal., until July 2 for work, including the hot water heating, gas fitting, plumbing, &c., of the new City Hall.

Isaac Coffin & Co., Boston, Mass., will place a No. 5 Richmond hot water heater in a house owned by B. C. Leonard of Boston.

The contract for heating the Odd Fellows' Hall, Norwalk, Conn., has been awarded to E. K. Lockwood of Norwalk, who will use a No. 50 Richmond steam heater.

Sealed proposals will be received by John H. Peck, chairman of the Board of Court House Commissioners, Troy, N. Y, until July 14, for heating and ventilating by the hot blast or plenum fan system the new court house for the county of Rensselaer.

John D. Mouatt, Detroit, Mich., is doing the plumbing in the Wilson apartment houses. He will furnish 24 bathrooms with enameled baths, water closets and lavatories, besides the kitchen and laundry fixtures.

Barlow Bros. Company, Waterbury, Conn., will do the plumbing work on a fine new residence now being built in that town for Geo. B. Lamb, superintendent of the Farrel Foundry & Machine Company.

Hon. George Nicols, Northfield, Vt., has awarded the contract for heating his house to E. H. Randall & Co., Concord, N. H., who will use a No. 55 Richmond steam heater.

The Theo. Jacobs Company, 72 and 74 Market street, Chicago, are to install a hot water heating plant in the residence of Oscar Foreman, Michigan avenue, near Thirty-fourth street.

Kehm Bros. & Mertz, 289 Kinzie street, Chicago, have the contract for steam heating in the residence of John J. Schillo, 218 Mohawk street.

The Walsott-Hurlbut Company, 175 and 177 Lake street, Chicago, are to furnish the Siphon Eduction closet ranges for school buildings at Pontiac and Streator, Ill.

Among the contracts recently taken by Cook & Chick, 253 and 255 Kinzie street, Chicago, can be mentioned the following: Steam heating plant in the residence of William Holtz, Barry and Graceland avenues; hot water heating plant in the residence of D. L. Thomas, Forty-eighth street and Madison avenue.

Sealed proposals will be received at the Commissioners' Office, Franklin, Pa., until July 6, for work, including the plumbing, in the Venango County jail.

The Common Council of Duluth, Minn., have confirmed the award of contract made June 11 by the Board of Public Works with Allen Black for steam heating and plumbing in the Central Fire Hall, at $3592.

The Davis Johnson Company, 45 Jackson street, Chicago, are to place Schill's New Idea warm air furnace in the following residences: P. Clements, 4253 South Halsted street; J. C. Whitten, 6538 Myrtle avenue; H. F. Rose, Sixty-third street and Greenwood avenue; V. C. Clare, Commercial avenue; John Bell, 5519 Emerald avenue; A. W. McCormack, 400 Sixty-seventh street; Geo. J. Shannon, Sixty-fifth and Peoria streets; Dr. E. B. Greene, Humboldt boulevard; Wm. M. Townsend, 7648 Ford avenue; Wm. Easton, 616 Waller avenue; W. F. C. Bronter, 1566 Fulton street.

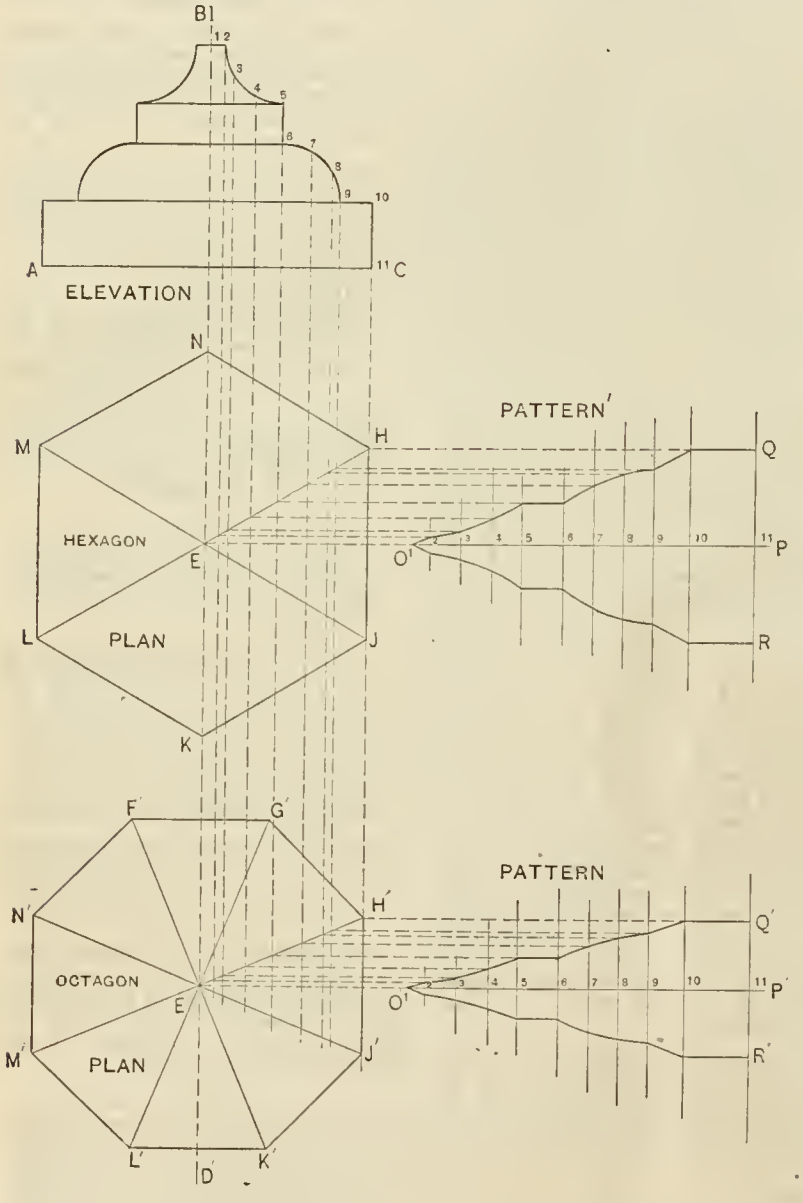
The new city directory of Chicago gives an estimated population of 1,700,000 to the Windy City.

ROOFING AND CORNICE.

Pattern for Article Having Any Number of Pieces.

From C. R., *Newark, N. J.*—Will *The Metal Worker* publish a method for obtaining the pattern of an article, such as a finial or leader head, in any number of pieces?

Answer.—We understand from the above that our correspondent wishes a method for obtaining the pattern of an article that is a regular polygon in plan. In the accompanying engraving let A B C represent the article in elevation for which patterns are required. Below the elevation is shown the hexagon H J K L M N, and the octagon F′ G′ H′ J′ K′ L′ M′ N′. These two plans show the manner in which the plan is to be drawn under the elevation for an article having any number of pieces. To obtain the pattern of an article that is a polygon in plan, first draw the elevation in such a manner that one side will appear in profile in the elevation, as B C, and place the plan so as to correspond in all respects with it, as shown. For the pattern of article A B C, the plan of which is a hexagon, proceed as follows: Divide the profile B C into spaces of convenient size and number them, as shown by the small figures. With the T square placed parallel with C J, and brought successively against the points in profile, drop lines across the miter lines, as shown by the dotted lines in the engraving. Lay off a stretchout, O P, at right angles to the side of plan H J, corresponding to the side of article B C of elevation. Through the points in stretchout line O P draw the usual measuring lines. Place the T-square parallel to the stretchout line, and, bringing it successively against the points in the miter lines, cut corresponding measuring lines, as shown. Lines traced through the points thus obtained, as shown by Q O R, will be the pattern of part of article shown by H E J of plan. The pattern for H′ E′ J′ of octagon, as shown by Q′ O′ K′, is obtained in a similar manner.



Pattern for Article Having Any Number of Pieces.

FLASHINGS.

A. S. Rasner of Rasner & Dinger, Pittsburgh, manufacturers of metallic skylights and sheet metal work of all kinds, will have the sympathy of his friends and the trade in general in the loss he has met with in the death of his son Albert, who lost his life a few days ago by drowning while bathing in the Allegheny River with some friends. The young man, who was in the employ of his father, was universally respected.

W. J. Burton & Co., Detroit, Mich., manufacture sheet metal cornices, ceilings, skylights, finials and shingles and furnish slate, tin and steel roofing. They issue a special catalogue of their Eastlake metal shingles and tiles, giving the advantages and full instructions for putting them on. All of their goods are painted on both sides. They also make a full line of conductors and elbows and eave trough of galvanized iron in 8-foot lengths.

In connection with the covered reservoir lately completed at Rockford, Ill., the roof employed is something of a departure from old style coverings for this purpose. It is of concrete, composed of sand and cement, but it is only 2 inches thick. It is supported on concrete arches which span the entire width of the reservoir, the ribs being 7 feet apart, 7 inches thick and about 1 foot deep over the top. After these were made expanded metal lathing of 2½-inch mesh was spread over the surface and then concrete laid on to the depth of 2 inches. The roof is calculated to hold a weight of 100 pounds to the square foot. After the temporary supports were removed the under side of the roof was plastered, completely covering the iron.

The White & Ennis Cornice & Roofing Company of Troy, N. Y., were incorporated last week, with a capital of $7500. Directors: David White, Jesse D. Ennis and Robert J. Wylie of Troy.

Among the contracts recently taken by James A. Millar & Bro., 129 and 131 Clinton street, Chicago, can be mentioned the following: Slate and other roofing for the residence of George P. Barton, Fifty-third street and Lexington avenue; cornice work for building of Henry Appel, Fiftieth street and Michigan avenue; 250 squares of corrugated iron work for Chicago Sugar Refinery; new red slate roof for Chicago

Club House, Van Buren street and Michigan avenue; slate roof and copper work for residence of Chas. F. Atkinson, 4833–5 Lake avenue; roof for new tower of Board of Trade building.

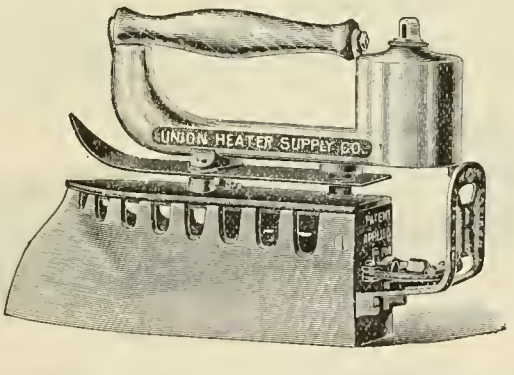
THE PENN IRON ROOFING & CORRUGATING COMPANY, LIMITED, of Philadelphia, Pa., have issued a number of supplemental pages intended to be inserted in their ceiling catalogue. The pages carry illustrations of plain reeded ceiling plates and sheets, designs of special shallow panel ceiling plates, shallow molded plates in combinations, together with colored designs showing corners of ceilings finished, while other designs are of centers and mold combinations. The pages are numbered, showing their position in the regular catalogue of the company.

JAMES J. WHITE, 185 Dearborn street, Chicago, is to furnish the tin roofing, galvanized iron cornice work and a skylight 40 x 60 feet, for a hotel building at La Fayette, Ind.

AMONG the contracts recently taken by J. C. McFarland, 2511 to 2519 State street, Chicago, can be mentioned the following: Copper cornice work and tile roofing for the residence of Leon Mandel, Michigan avenue and Thirty-fourth street, the Telladon Terra Cotta Company's new shingle tile to be used; copper cornice work and tile roofing for residence of Philip Armour, Jr., Michigan avenue and Thirty-second street; slate and copper work for the court house at Aledo, Ill.

Self Heating Tailor's Iron.

The Union Heater Company, Detroit, Mich., manufacture a self heating gasoline tailor's iron, a general view of which is shown in the accompanying illustration. The body is made of cast iron and the tank is of brass, both being heavily nickel plated. The burner is on the inside and the gasoline passes from the tank down through a brass generator, which is also on the inside of the iron, flows into a valve and then into the regular burner, where the flame strikes the bottom of the iron. The flame is controlled by an angle valve on the back in such a manner that it can be brought from a low flame to an intense heat immediately. The irons are manufactured in three sizes, 18, 20 and 22 pounds, and can be operated, it is said, at the small expense of 2 or 3 cents a day, enabling the tailor to turn out more work with greater comfort, and get rid of the annoyance of dirt and soot met with in the use of charcoal.



Self Heating Tailor's Iron.

The Fennessy Company of New York City have been incorporated, with a capital of $20,000, to deal in patented gas and oil burners, stoves, heaters, &c. The directors are Frank R Fennessy, Emma H. Fennessy, Chas. Feichheimer and Eugene A. Schell of New York.

Rustless Iron.

At the recent Montreal meeting of the American Society of Mechanical Engineers, M. P. Wood presented a paper on "Rustless Coatings for Iron and Steel." It is a general summary of the methods in vogue without special reference to any experience personally acquired. Mr. Wood summarizes his conclusions on the whole question of how best to protect iron and steel from corrosion as follows:

Don't use anything but common iron.

Don't have any scale on that.

Don't use anything but the best iron and steel.

Don't polish those.

Don't paint it with anything but pure linseed oil and oxide of lead or graphite paints.

Don't let the air get to it if it is damp.

Don't keep it from the air if the air is pure and dry.

Don't let sea air, sea water, acidulated or sulphurous, ammoniacal or other fumes and liquids have access to it.

Don't think it unnecessary to protect it in any case, because swords, armor and other bright articles of iron and steel have been found uninjured by rust after an exposure of over 500 years with no other protection than that afforded by the closed room in which they were placed.

Don't think your own product would not under the same conditions last as long as the piece of iron that was walled into one of the burial chambers of the Pyramid 3000 years ago.

Don't put it in any location where it cannot be inspected and its true condition ascertained at any time, by anybody, your successor in the trust not excepted.

Don't think that magnetic oxide, electroplating, enameling or any other method of protection will take the place of constant inspection, even if the coating is fired on by a Columbiad.

Don't imagine because Cleopatra's Needle has had to have a coating of wax to protect it, that it is not a good material to apply to other substances than granite.

Don't let the cost and interest accounts be the governing factors in the case of protecting any metal superstructure on whose continuity and strength human life and safety depend The old story of "for want of a nail the shoe was cast, the horse disabled, a battle and kingdom lost," finds too many parallels in the engineering practice of to day, until in some cases we seem to need protection from the engineer quite as much as from the decay of the materials in which he experiments.

Don't imagine that Macaulay's New Zealander, who has sketched the ruins of England's power and greatness, and has come to the New World to see how we have fared from the gnawing teeth of time, will not recognize amidst the ruins of our Statue of Liberty, Brooklyn Bridge and other monuments of our progress, the ominous streaks and stains due to the corrosion not only of iron and steel, but that of the better class of metals, and will exclaim: "We are wiser in our generation and fear not and can control these forces that, like the Arch, slumber not nor sleep."

In the discussion, J. F. Holloway called attention to the fact that tin roofs in Montreal were not painted, a circumstance which was attributed to the use of good materials and the distance from the sea air. C. W. Nason reported that for tank and outdoor use, in his experience, the best protection is the P. & B. paint, a solution of asphalt in bisulphide of carbon. Gus. C. Henning called attention to the experiments recorded by W. Thomson in a paper read before the English Society of Chemical Industry. The method proposed is to connect structures by wire with a ball of zinc buried in moist ground, thus transferring the destructive effects of electrolytic action to an outside body.

James McBride of Brooklyn related his experience with a number of boilers in his paper, "The Corrosion of Steam Drums." From his observations and experiments, extending over nearly four years, he draws the following conclusions:

1. That the corrosion is due primarily to excessive moisture in the steam in the drum.

2. That moisture in this case was due to the priming of the boilers and surface condensation in the drum.

3. That the trouble was aggravated, because no provision was made to take away the water from the drums by drip pipes.

Professor Hutton presented a sketch of a 3-inch cast iron elbow from the bottom of the descending column of a Bulkley condenser used near Port Henry, N. Y., as an illustration of mechanical corrosion. J. T. Hawkins gave it as his experience that currents of water in pipes wear away the metal, and that the impact of steam or water or water laden steam produces the same result. L. S. Randolph noted that water charged with sediment causes corrosion by attrition and by the mechanical removal of the oxide. Fred. Grimm reported that trouble caused by corrosion in steam coils was overcome by establishing good drainage.

Extensive improvements are being carried out at the sheet iron mills of the McCullough Iron Company, North East, Md. Several oil burning furnaces are being introduced, and a tank to hold 25,000 gallons is in course of construction for the purpose of supplying oil to the furnaces.

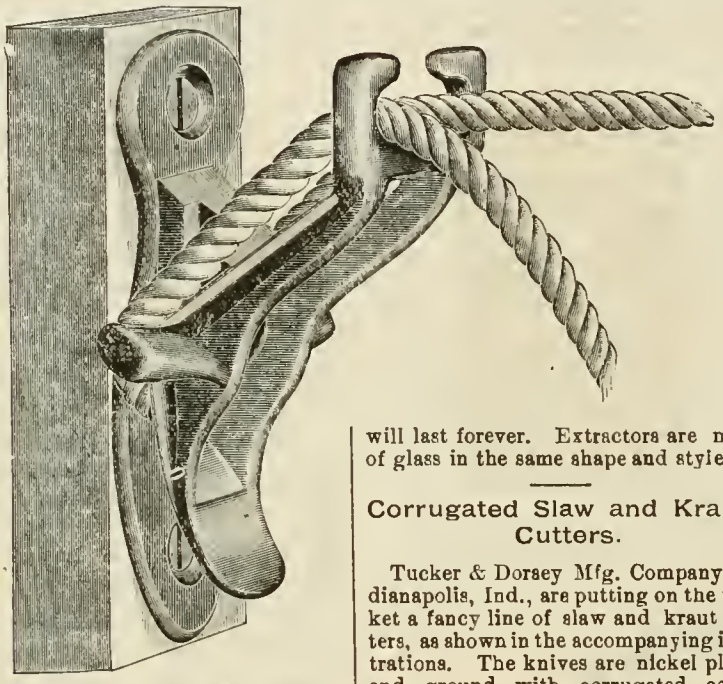
Asbestos, says a South African journal, is being mined in large quantities on the Kalputs farm, Prieska District.

The result of the Derby race was received in New York by the United Press from the office of the Direct United States Cable Company just one second after it was filed in London.

THE RETAIL STORE.

Lightning Clothes Line Fastener.

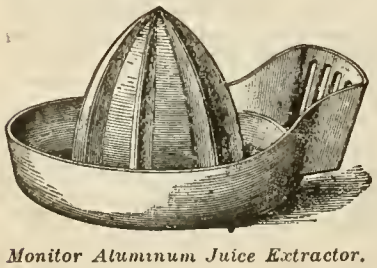
The accompanying cut represents a clothes line fastener introduced by the Standard Mfg. Company, Florence, Mass. Among the desirable points claimed for the fastener are the following: That the line can be put up, taken down, tightened or slackened in a moment; that knots are obviated; that lines cannot slip; that cold or wet weather does not affect the fastener; that should a line break between two fasteners the remaining line or lines would in no way be disturbed, and that no clothes pole is required, as a pull on the line makes it tight and the fastener holds it. The fasteners are furnished japanned or galvanized, packed one dozen in a box, two gross in a case. The manufacturers will furnish a sample free, post-paid, and will quote prices upon application.



Lightning Clothes Line Fastener.

Monitor Aluminum Juice Extractor.

Sterling Aluminum Company, 1195 Fulton street, Brooklyn, N. Y., are offering the aluminum juice extractor here shown. It is cast of pure aluminum and has well defined ridges on the cone. It has a large reservoir to hold the juice and an ample spout and strainer. It is not necessary to use it in connection with a cup or glass, as the reservoir catches the juice, so the extractor may be used anywhere. The manufacturers claim that fruit acids do not affect it; that it will not corrode or tarnish; that it will not break like glass, and that it will last forever. Extractors are made of glass in the same shape and style.



Monitor Aluminum Juice Extractor.

Corrugated Slaw and Kraut Cutters.

Tucker & Dorsey Mfg. Company, Indianapolis, Ind., are putting on the market a fancy line of slaw and kraut cutters, as shown in the accompanying illustrations. The knives are nickel plated and ground with corrugated edges.

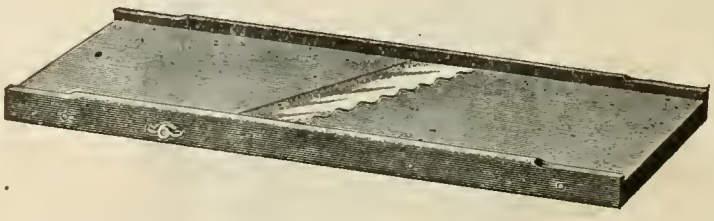


Fig. 1.—Corrugated Slaw Cutter.

The goods are referred to as made throughout of extra quality material and of handsome finish. Particular attention is called to the patented device for the adjustment of the knives, it being explained that the bolts are loosened, the knives set for the desired cut, and the bolts again tightened, no other directions being necessary. By taking out the bolts the knives are released and may be removed for sharpening.

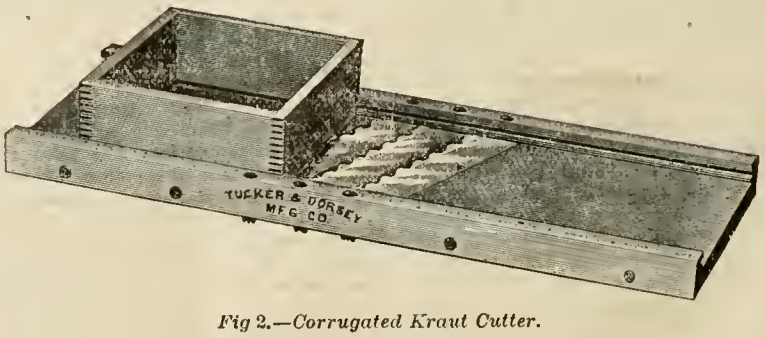


Fig 2.—Corrugated Kraut Cutter.

Wick Raising Movement and Lighting Lift.

The Plume & Atwood Mfg. Company, 18 Murray street, New York, are applying improvements to all their Nos. 1 and 2 Royal lamps and founts as herewith illustrated. The ratchet wick raising movement shown in Fig. 1 gives, it is stated, perfect control of the wick with exactness in adjustment. The point is made that it overcomes the objection to the draw bar lift, which in regulating is apt to move beyond the point desired, causing the annoyance of a smoked chimney or an extinguished flame. The lighting lift in Fig. 2 lifts on a spiral movement and remains in position while lighting without removing either shade or chimney, leaving the hands absolutely free. The improvements are put on the Royal hand, table and banquet lamps of different designs, and also on those in wrought iron patterns.

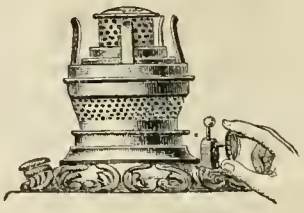


Fig. 1.—Ratchet Wick Raising Movement.

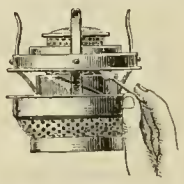


Fig. 2.—Lighting Lift.

Hoffman's Vault and Library System.

The Geuder & Paeschke Mfg. Company of Milwaukee, Wis., have absorbed the business of the Hoffman-Keefe Office File Company, and are now manufacturing that company's specialties, among which are the Hoffman vault and library fixtures, recently

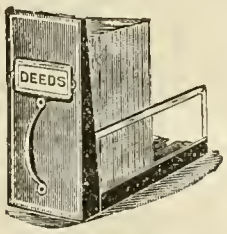


Fig. 1.—Document File.

brought out. By this system, large vaults for the use of banks, merchants and manufacturers, requiring a large amount of room for the storage of valuable papers, are fitted up with metal shelving, drawers, compartments, files for letters, &c. Illustrations are here-

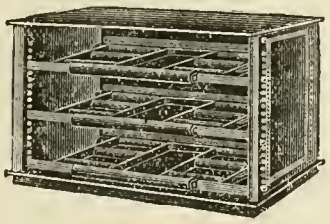


Fig. 2.—Roller Book Shelves.

with given of some of the features of the system. Fig. 1 is a file for compressing documents. The compressor grips the papers from the center down and squeezes them. The file comes

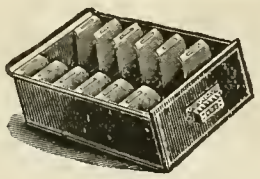


Fig. 3.—Check Sorter.

clear out of its compartment and hangs there. The papers can be shuffled any way, as the file has no sides. A special kind is made for bank checks. Fig. 2 represents

Fig. 4.—Metal Cabinet.

a set of roller book shelves intended for storing large, heavy office books. They are laid flat and given an even bearing on rollers to prevent friction or wear. Fig. 3 shows a check sorter which has been found very convenient in banks. In Fig. 4 is shown a metal cabinet. Fig. 5 represents a nest of safety deposit cells, each with its own key. These are frequently used by large companies, each of whose officers desires a storage place for his own personal documents and valuables. Fig. 6

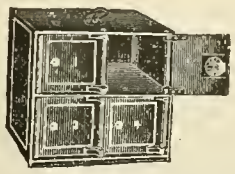


Fig. 5.—Safety Deposit Cells.

is a vault omnibus or movable case, which is found a most convenient article in offices in which a large number of books and papers are in daily

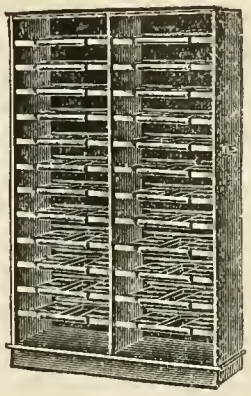


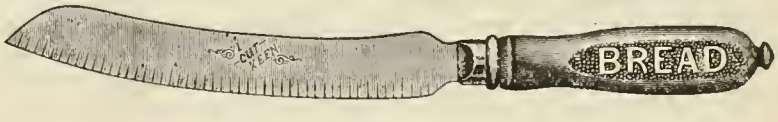
Fig. 6.—Movable Case.

use outside of the vault. It is made with roller book shelves. The whole case is mounted on double wheel anti-friction casters, so that one person can easily run it in and out of the vault. The casters are hidden by the risers of the base.

The Goodell Bread and Cake Knife.

The cut here shown represents a bread and cake knife put on the market by Goodell Company, Antrim, N H. The knife has a curved. saw toothed cutting edge, and it is remarked by the company that the high grade of steel used in the blade enables it to be made very thin. The side of the blade is perfectly flat, the corrugations or curves extending about ⅛ inch from the edge, being the same depth their entire length.

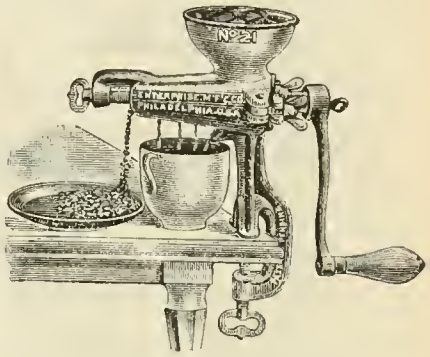
The makers state that when necessary the blade can be ground on the side opposite the grooves without changing the shape or cutting qualities of the edge in the least; also that no skill is required to do this, as it would be impossible to get the edge out of shape. The manufacturers claim that the feature of sharpening is peculiar to this knife, and that it can be sharpened again and again and remain practically as good as new. The point is also made that the style of the handle, shape of the blade and the general appearance of the knife are attractive. The knife is referred to as particularly adapted to cutting hot bread and cake.



The Goodell Bread and Cake Knife.

Enterprise Juice Extractor No. 21.

The cut here shown represents a juice extractor put on the market by the Enterprise Mfg. Company of Pennsylvania, Philadelphia, for whom J. C. McCarty & Co. are agents, 97 Chambers street, New York. The manufacturers state that the construction of the extractor is mainly the same as their regular combination press, with the addition of such mechanical devices as to adapt it for the extraction of juice from meat, also answering for extracting seeds and



Enterprise Juice Extractor No. 21.

juice from fruits. It is explained that the machine being tinned no metallic or inky flavor will be imparted to the material used, and that the dryness of the pulp or refuse can be regulated by the thumb screw at the outlet.

MEMORANDA.

Frank Hesse of Clarksville, Iowa, announces that he has secured the services of W. A. Kirck, a practical cornice man, and is prepared to manufacture anything in that line. Mr. Hesse carries in stock a varied assortment of stoves, hardware and tinware.

S. Fox of No. 139 New Main street, Yonkers, N. Y., has recently doubled the capacity of his house furnishing store. The premises now occupied are 25 x 50 feet in size, and in calling the attention of the people of Yonkers to the increased capacity of the store Mr. Fox distributed fans on the back of which are verses telling in a clever way of the growth of the business, and asking patronage of the good people of Yonkers.

The Ellicott Electric Heating Company of Buffalo were incorporated on June 22, with a capital of $25,000, to manufacture apparatus for electricity for heating and power purposes. The directors named are C. W. Pardee, John N. Scatcherd, Daniel O'Day, Edwin T. Evans, Barrett Rich, George Urban, Jr., Joseph L. Hunsicker, Charles R. Huntley, John J. Albright, Edmund Hayes and Franklin D. Locke of Buffalo.

STOVE TRADE NOTES.

Philadelphia Stove Trade.

The season has opened and salesmen are out, but reports so far indicate that the bulk of the business will be somewhat late. Sufficient business, however, is being done to create a demand which exceeds the production, and there being practically no stocks in the hands of dealers, manufacturers anticipate a good season's business. Dealers are hesitating about placing their orders, many questions arising to delay action. They realize that the hand to mouth buying indulged in last season will not be safe to attempt this year. Stove manufacturers have all along been producing only in quantities sufficient to supply current demand, and count on taking care of any increased inquiry which a change in the business conditions of the country may bring by running their works full capacity. The opinion prevailing is that such a change is not far distant, and by fall foundries will be running full. Buyers, therefore, are studying their prospects for business, and orders will assume fair proportions. Duplicate orders cannot be depended on, as in the event of a rush, which is not at all improbable, the filling of orders would not be prompt and serious delays would ensue. Orders would, of course, have to be taken in rotation and it would be hard to specify dates for delivery.

Wise dealers are already approaching their customers on the subject of repairs. Manufacturers have very light stocks of repairs on hand, and if their foundries have to stand a run on them for finished goods it will be impossible to pay attention to repair orders, as every flask will be utilized in getting out the regular goods, and it would be neither expedient nor profitable to bother with repairs. The latter can be readily furnished now, but it is likely there will be difficulty experienced in getting them later.

Prices of goods are firm, and in view of the fact that owing to the decreased production of foundries the cost of production has been greater, there is not the slightest prospect of a cut in prices being made. It is true that the cost of iron is very much reduced, but the cost of labor remains the same and the gain on account of cheap iron is too trifling to take into consideration. Again, no more business could be done by cutting prices, the decrease in production all round offsetting any necessity for seeking to unload at a sacrifice.

Collections are slightly better than when last reported, although they are far from being up to the mark. There is still a good deal of laxity on the part of some in the trade to make settlements, and they will not settle in cash where there is the slightest possibility of the acceptance of a note. At no time does a business man better enhance his credit than when during a period of depression he comes to time with his payments.

St. Louis Stove Trade.

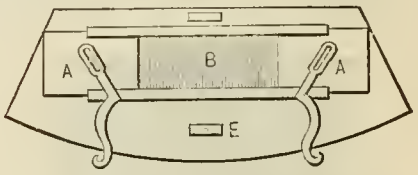
The stove trade is beginning to show signs of returning activity. The total number of stoves sold since January 1 will compare favorably with preceding years. The cutting of freight rates contributed largely to this end, and it is for this reason that stocks are not now abnormally large. During the past three months production has been curtailed very materially, only one foundry out of four running, and that one only three days a week. This reduces the production 87½ per cent., and as sales are nearly equal to those of last year, it can be seen at a glance that any unusual demand will rapidly deplete stocks. While the outlook could be better, yet it is more than satisfactory when the same period of last year is taken into consideration. At that time everything was muddled and it was impossible to choose the weak from the strong dealers. Now, however, it is radically different. Dealers who came through last year are in a position to weather almost any kind of a storm, and their credit is, in most cases, improved by their experience.

A peculiar feature of this season's trade is seen in the introduction of two styles of stoves which are creating more or less attention. They are the hot blast stove and the wood burning stove, known as the air tight heater. This latter stove has been on the market for two years past, but has never created very much attention until this year. The sale promises to be large and is generally conceded by stove manufacturers to be a good thing, as it will largely take the place of box stoves, which, it is stated, have long been sold at a loss to the manufacturers.

The hot blast stove is, practically speaking, a small furnace, which, instead of having the ordinary jacket of galvanized iron, is inclosed in a cast iron casing of elaborate design, which in appearance is as artistic as a base burner. The claim is made that these stoves are easily regulated, clean, economical in the use of fuel and will hold fire for 24 hours without attention. The hot blast and the air tight heater are dividing attention with the steel range, which is also a leader just now. The local makers are busy with new goods, which will shortly make their appearance in the catalogues issued by the different manufacturers.

Improved Regulator for Stoves.

A rather novel means of checking the draft in stoves has recently been brought to the attention of the English trade by an inventor named Tibbits. It is conceded that the ordinary domestic grate in use in England is far from perfect and that the appliance referred to tends to accomplish a great saving in the way of fuel. We cannot do better perhaps than to republish the inventor's description of the device, which in connection with the illustrations presented herewith will enable the reader to comprehend the construction and operation of the device:



Improved Regulator for Stoves.—Fig. 1.—Showing Regulator Open.

This invention consists of an iron plate the size of the bottom of the stove, with two doors running in slides, and opened and shut by levers. The plate is fixed underneath the bottom of the stove by the aid of two small screws and nuts, which hold it up to the bottom. When the doors are open (for lighting the fire or drawing it up) the levers or handles project slightly in front, as shown in Fig. 1 of the cuts.

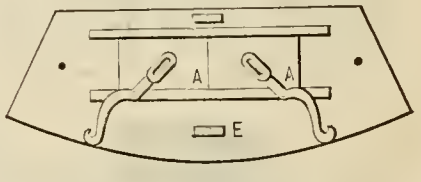


Fig. 2.—Showing Regulator Closed.

When the doors are closed (to obtain slow combustion) the levers or handles will be as far from one another as possible, and hidden under the bottom bar of the grate, as indicated in Fig. 2.

Referring to the illustrations, A represents the doors; B, the open space when the doors are open; E, the slot through which runs the screw which, with a nut below, fixes the plate to the bottom underneath the stove. Both figures show that side of the plate which when fixed will face the hearth.

Peoria Stoves

is the title adopted by Culter & Proctor Stove Company of Peoria, Ill., for their 1894 catalogue. This publication is a handsome volume of 88 pages, in the popular small size. It is bound in scarlet cloth, lettered in gold, and the edges are tinted in yellow. The pages have a half border, consisting of a red line, with the company's trade-mark at the upper corner. An introductory note calls attention to the special stoves and ranges enumerated in the catalogue, for which superiority is claimed in quality, finish and accuracy of castings, peculiar and perfect adaptability to the various fuels used in the West, and a number of other points. The most prominent position is given to the Peoria-Lexington six-hole range, intended for either coal or wood. It is shown in a number of styles—with high and low closets and reservoir, with high closet and reservoir, with high shelf and reservoir, with tea and pipe shelves and low closet and reservoir, with tea stands and reservoir and in square form with no accessories but tea stands. It is furnished in three sizes, is attractively designed and ornamented, and is offered as a first-class range in every respect. A four hole range, exclusively for soft coal, is also made under the name Peoria-Lexington, which is furnished in any style and in two sizes. A line of cook stoves, from entirely new and original patterns, is presented under the same name. They have flush tops and square ovens, are constructed on graceful lines with skirting and panels effectively ornamented, are especially adapted to soft coal, and are furnished in three sizes. Another line of soft coal cooks, in six sizes, is shown under the same name, at a somewhat lower price. The Wabash is an attractive but low priced coal and wood cook, made in two sizes. The Woman's Rights is a cheap coal cook in one size only. The Antelope range is a four-hole wood burner, made in all styles and three sizes. Antelope wood cooks are also shown in various styles and are furnished in four sizes. Heating stoves comprise, under the general name Peoria, several styles of all cast wood base heating constructions of the Todd type, but with special features of construction and draft covered by patent; a square hot blast base heater for wood; a square hard coal base burner, and a square soft coal base heater. Other heating stoves shown are the Challenger, a round surface burning base heater for hard coal or coke; the Model Peoria, a square hot blast ventilating parlor heater for soft coal; the Peoria Queen, a square stove for soft or hard coal, designed as a substitute for the oak style; the Peoria Oak, in a number of forms, to cover all requirements; the Oak Cottage, for coal and wood; the Black Hawk, a new cannon stove; the Chief, an extra heavy cannon stove; the Sprite, a two-hole dwarf stove, for coal or wood; the Sunbeam, for hard or soft coal, and the Empress, for wood. The company also manufacture Magee's patent kitchen sink and common sinks and carry in stock a complete line of ground and plain hollow ware.

Charles E. Coleman, representing Eugene Munsell & Co., 218 Water street, New York, is sending to his friends in the trade a miniature grip with a tag attached, and accompanied by a letter, the body of which reads as follows: "I send herewith my grip as a reminder that I will visit you in a few days. Kindly hang this up, and in the meantime do not complete arrangements for your fall line of goods until I see you. That's all."

ODD PLATES.

The gas manufacturing companies have affected the business of selling gas stoves in more ways than one. For the purpose of increasing the sale of gas they hastened the introduction of gas stoves, until they are now no longer regarded as an experiment or luxury, but as a standard article. The method of introduction has been to furnish a stove at so narrow a margin of profit that, without the profit received from the sale of gas the traffic would not be a paying one. If the interest created by this method of bringing the stoves before the public is not taken into account the method may be deplored, but it is generally considered that, in spite of the times, more gas stoves will be sold this year than in any previous one. This is largely due to the fact that there are a number of factories making gas stoves this year for the first time; a better stove being offered and generally at prices very much reduced. Owing to the financial depression the consumers are not buying as they otherwise would, and those factories which have a stock of new goods are making sales at low figures. The gas stove dealer gets a share of the orders, as many buyers do not care to have the gas company know a gas stove is being used. The dealer, while getting a better price, as a rule, than the gas companies, insists on buying at low prices that are unsatisfactory to the makers. It is urged that this reason, and the belief that there is still a large and profitable future for the gas stove, has induced several of the larger makers, holding a number of valuable patents, to consider the consolidation of their interests in one large company. The object, doubtless, is to save a large expense in selling the goods, as well as in producing them. Whatever may be the result of this effort it points to two things: the one being the faith that, in the near future, the gas stove will be more generally used; the other that, to both the maker and dealer, the present prices and sales are not such as make the business thoroughly satisfactory.

Notwithstanding the severe business depression which has prevailed all over the country during the past year the Favorite Stove & Range Company of Piqua, Ohio, have been making improvements with a view to increasing the capacity of their already extensive plant. Prominent among the changes which they have made may be mentioned the grouping of their nickeling, buffing, grinding and polishing departments in one large brick building especially erected for the purpose, thereby increasing fully one-half the size of their former mounting room. They have also completed the erection of a new boiler and engine house, fitting and equipping it with a large size Hamilton Corliss engine, with a battery of boilers and an electric light dynamo.

The "Journal of the Royal United Service Institute of Great Britain" records that during the last military maneuvers in Russia experiments were made with the Norwegian cooking stove, the object being to provide the troops on the march, within the least possible space of time, with warm food. The apparatus used was the ordinary camp kettle fitted into a thick felt covering. The soup or stew being placed in the kettle is raised to the boiling point and then removed from the fire, the lid clamped down, the kettle inserted in the sheath, and the whole slung in the usual manner below the wagon. The process of stewing continues automatically, thanks to the heat retained, and even after several hours' marching the temperature does not fall below 100° F.

The Favorite Stove & Range Company, Piqua, Ohio, have been getting out some new stove trade literature in the way of a handsome catalogue, copies of which are being distributed to the trade. This handsome publication has been carted to the post office in barrel lots at the rate of not less than two barrels a day, and at latest advices the work of distribution was not yet completed. This is significant when it is taken into consideration that the catalogues are sent only to customers whose names appear upon the books of the company. A review of this handsome volume appeared in these columns last week.

The Safety Furnace Pipe Company, Detroit, Mich., have kept their force busy making up their specialties for furnaces and the elbows, boots, register boxes, &c., for house heating during the winter. Their trade is steadily widening, recent shipments having been made to Los Angeles, Cal., and New Orleans, La.

The Eclipse Stove Company of Mansfield, Ohio, send us a package of advertising matter, among which is a little pamphlet of 40 pages containing testimonial letters from those who have used Eclipse stoves and ranges; a circular descriptive of the Eclipse Russia iron and sheet steel roaster and baker; a folder giving the shipping weights of various lines of stoves; another folder which gives directions for operating stoves and a catalogue relating to the Premier Eclipse six-hole range. The latter is a handsome construction of substantial appearance and embodies the modern improvements. It is made in several sizes, arranged for burning coal and wood and also for burning wood exclusively. The manufacturers refer to the flue construction as being of such arrangement and capacity as to give a full and free circulation.

L. G. Comparet, 314 Walnut street, Des Moines, Iowa, has brought out, in connection with a line of steel ranges, a portable oven made in two sizes. In making this line of ovens the intention has been to present a mode of construction which would meet every requirement of economy, durability and heating capacity. The body of the oven is made in two thicknesses of No. 27 galvanized iron, well riveted, double seamed and braced, and having a lining of heavy asbestos board. The flues are of heavy steel and the shelves are of steel strips riveted together. Mr. Comparet states that the ovens have been thoroughly tested in many of the leading bakeries, hotels and restaurants throughout the State of Iowa.

The Girard Stove & Foundry Company of Girard, Ohio, send us a copy of a catalogue and price-list which they have just issued, relating to the Adelbert stoves and ranges. This is the first catalogue which the company have issued, and in the announcement to the trade they give a few facts concerning their history. The Adelbert stoves and ranges, it is pointed out, are manufactured from the best quality of material, embody the latest improvements and are ornamented in an attract-

ive style. Numerous varieties are produced, several of which are illustrated. The leading cooks are the Adelbert Jewel, Adelbert Home and Adelbert Hayden. The heaters are represeuted with the Adelbert oak in the leading place. This is richly ornamented, has an all cast body and is well mounted and cemented. The Adelbert Cosy is a pretty Franklin stove, with circular fire pot, and adapted for burning hard or soft coal, coke or gas. Egg and cannon stoves are also shown.

THE MICHIGAN STOVE COMPANY favor us with one of their new portfolio pocket envelopes, intended for use in carrying papers. It is sufficiently large to hold legal documents. The Garland trade mark is visible on it, but nothing else in the nature of an advertisement of the company. On the inside of the flap is a table showing the population of the leading cities and another showing the population of the States. Blanks are arranged also for the insertion of identification details. Circulars have also been received from the same company referring to their specialties. One is entitled "Fact *vs.* Fiction," and is an array of arguments to prove that Garland stoves and ranges are not too high priced for certain markets, and that in fact there is no place in the world where stoves are used but that Garlands can be sold. Another circular illustrates and describes the Carbon Garland parlor heater, for soft or hard coal, and the Maple Garland base heater for wood. The Carbon Garland is described as a "parlor furnace" on account of its heating qualities, while the Maple Garland is offered at the request of numerous customers for a strictly first-class base heating wood stove. The wood burns upon the bottom instead of a grate, bringing the heat nearer the floor than if a grate was used.

THE WESTERN STOVE MFG. COMPANY, St. Louis, who have been closed down for some time past, will resume operations on July 2.

A OORY RED is the color adopted by Bergstrom Bros. & Co. of Neenah, Wis., for both the envelope and cover of a 16 page catalogue which they have just issued. It relates principally to the Elmhurst surface burning parlor stove. Reference is made to its beauty of design and ornamentation, heating capacity, economy of fuel, convenience, durability and medium price. It has been on the market for 12 years, yet has been often changed, always bettered, and this year it is entirely new in ornamentation and interior arrangement. Hot air flues have been added to increase its heating capacity. It has also full side and base flues, giving greater radiating surface, also a new device in the nature of a gas flue to consume the gas forming over the fire. Large sizes are made for heating halls and churches. Several pages of testimonials from enthusiastic users are printed. Some points are given with reference to the Royal Oak made by this firm. It also has a large air heating flue, and is constructed with a view to durability and practical value as well as ornamentatal appearance.

C. S. REYNOLDS & Co., Columbus, Ohio, have just completed a new line of cook stoves and ranges, which they are offering under the name Noonday. Two sizes are made for burning wood and two sizes for coal. The latter is offered with pouch or side feed and is furnished as a four or six hole range, made square and with or without reservoir. The company have also brought out a new cheap cook stove, intended for using coal or wood, and which is known as the Crystal Noonday. This is also made in two sizes, Nos. 8-18 and 8 20 being designed for coal and Nos. 8 20 and 8 22 for wood. The Noonday series are of the latest design, attractively decorated and embody the modern improvements.

THE RINOEN STOVE COMPANY of St. Louis, Mo., send us an illustrated circular of Quick Meal torches and lamps for gasoline, which are offered in several sizes. The construction of the Quick Meal torch is said to be simple, its flame bright and clear, and the device specially adapted for use in foundries, machine shops, factories, &c. The circular also illustrates the Quick Meal furnaces for gasoline designed for plumbers' and tinners' use, tailors' establishments, &c.

CHARLES D. SCOTT, successor to Weaver & Cheyney of 275 South Third street, Philadelphia, sends us circulars illustrating some of the goods for which he is sole agent. Among these may be mentioned the Warren five-hole brick set range and the Splendid fire place heater, both made by the Fuller & Warren Company of Troy, N. Y. We also have a pamphlet illustrating and describing the Automatic hot air furnace, which is made of both cast and wrought iron with a broad shallow fire pot, revolving grate bar and automatic damper, which regulates the draft of the fire by the expansion and contraction of a brass tube. This automatic damper, or governor, is fully described and illustrated, as is also the Weaver & Volkmar range, which is made in three sizes. Several pages of the pamphlet are given up to the names of customers who have for years been using some of these specialties.

J. B. BORDEN of F. M. Borden & Bro., Philadelphia, spent last week in Baltimore, doing a satisfactory business in gas and gasoline stoves and refrigerators.

A VAPOR STOVE comprising a low down tank, an expansion chamber having a burner cap with an induction tube extending across the center of the chamber, an initial burner separated from the expansion chamber by a shield, a fluid supply pipe leading from the tank, a vapor controlling valve and a separate valve to control the flow of the fluid to the initial burner has recently been patented by Henry Ruppel of the Dangler Stove & Mfg. Company of Cleveland, Ohio. In the present construction the inventor has done away with the necessity of pressure in the oil supply pipe, this being accomplished by the peculiar construction of the burner. This has, as the basis of the principle upon which it is constructed, means for expanding the vapor and air after passing into the burner, and consists of a mixing chamber or drum, which is entirely closed excepting where it is penetrated by the air and vapor supply tube and at its top, where it is covered by the burner cap. The tube passes very nearly across the drum, so that the commingled air and vapor therein, after entering in a cool state, is exposed to the radiated heat of the burner and thereby expanded, so as to produce an outward pressure through the burner cap. This, it is claimed, promotes a steady and even flow of vapor to the flame while maintaining a uniform pressure. A noticeable feature of the stove is that the oil is delivered practically direct from the tank to the burner by a most simple construction and without the intervention of anything to alter or affect the transmission of the oil except the exposure of the oil duct to the heat of the burner and the pipe for mixing the air and vapor.

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TRADE REPORT.

The Iron Market.

The Coke situation continues very puzzling. It was expected that the men would return to work early this week, but they have not done so. One of the leading operators is quoted as saying that there will be some serious disturbances before the majority of the plants are again at work. The largest producer seems to be making no efforts comparable in earnestness with those during a similar contingency in former years. It is reported that this same interest is trying to buy some Coke and is also in the market for Bessemer Pig. Yet the same interest is supplying Eastern concerns with the required quota of Coke.

Rumor has it that Steel Billets from the Chicago district have sold for Cleveland delivery. Operators are acting conservatively, and are not offering the inducements to buyers which they would quickly do if the situation were fairly clear.

In the Wire trade the season is pretty well over, so that the demand for Rods and for Wire Billets will be light for some time to come. Rumors are afloat that a large German manufacturer has consigned a considerable quantity of Barb Wire to this country, to remain in bond in anticipation of the passage of the tariff bill, with its provision making Fencing Wire free.

Charcoal Pig Iron has drifted into a frightful condition. We understand that Lake Superior Car Wheel is being offered at $13.50, Buffalo, while Southern Iron has gone as low as $15, delivered, Boston.

Pig Iron.—In the New York market local agents report only a very moderate demand and complain that low prices continue to be made by some of the furnaces. Charcoal Iron has been selling at very low prices lately. Sales in this vicinity of Lake Superior Car Wheel Iron have been made on the basis of $13.50, Buffalo, while Southern Car Wheel has been offered at $15, delivered at Boston. We note below the result of the auction sale. There is still some demand for spot Bessemer. Ohio Irons are weaker. We quote standard brands $12 50 @ $13 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.75 @ $10.25.

In some respects the Philadelphia Pig Iron market is improving. There is plenty of Iron at quoted rates, but there is none to be had at concessions, and some brands are firmly held at outside figures. Averaging the market all around, it may be said that while it is very dull, the undertone of firmness is greater than appears on the surface, which would be quickly shown on the slightest indication of a better demand. At present things could hardly be more lifeless, but general quotations for Philadelphia and near by points remain about as follows:

Standard No. 1 Foundry X	$12 50 @	$13.00
Standard No. 2 Foundry X	11.50 @	12 00
No. 2 Plain	10 75 @	11.00
No. 1 Soft	11.50 @	11.75
No. 2 Soft	10.75 @	11.00

Sales of local Coke Iron in Chicago have been fully up to previous weeks. Agricultural implement manufacturers are placing their season contracts for Pig Iron freely, and there are plenty of others who have not yet covered their requirements. Prices might be expected to advance under these circumstances, but furnace companies are still sharply competing for business and this keeps values down to their old range. Southern freight rates are to be advanced 25¢ on the 1st and quotations are changed accordingly. A fair demand is noted for soft grades for quick shipment, but there is little inquiry for deliveries extending over any considerable period. Some of the large Southern companies have withdrawn from the market altogether and are not making quotations on any grades. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @	$15.50
Local Coke Foundry, No. 1	11.25 @	11.50
Local Coke Foundry, No. 2	10.50 @	11.00
Local Coke Foundry, No. 3	10.00 @	10.50
Local Scotch	11.50 @	11.75
Ohio Strong Softeners No. 1	13.00 @	13.50
Southern Silvery, No. 1	@	
Southern Silvery, No. 2	@	
Southern Coke, No. 2	10.50 @	10.75
Southern Coke, No. 3	10.25 @	10.50
Southern, No. 1, Soft	10.50 @	10.75
Southern, No. 2, Soft	10.25 @	10.50
Tennessee Charcoal, No. 1	@	
Tennessee Charcoal, No. 2	@	
Alabama Car Wheel	17.50 @	18.00
Jackson County Silvery	15.00 @	16.00

The Pittsburgh Pig Iron market is reported as extremely quiet, there being very little doing, either in spot Iron or for forward delivery. Foundry Iron is almost entirely neglected; consumers who heretofore bought in 100 and 200 ton lots now place their orders for a carload or two. In spite of the light demand prices are rather firm, there being little disposition to shade in order to get business. For deliveries during the next two or three months we quote as follows:

No. 1 Foundry	$11.50 @	$11.75, cash.
No. 2 Foundry	10.75 @	11.00 "

In Southern markets, as reported from Cincinnati, supplies of Foundry Coke Iron are so nearly exhausted that any one who has any Iron to sell can readily obtain an advance of 25¢ ℔ ton for No. 1 Soft, No. 2 and No. 3. The demand while not large exceeds the offerings, and quotations are not much better than nominal. There is more urgency than ever before to have Iron delivered on contracts long past due, and in fact in most cases such demands cannot be complied with. This throws current consumers on the market to buy what they must have. The demand, therefore, especially for No. 1 Soft and No. 2 Soft, is far in advance of the ability of the furnaces to supply. There is some inquiry for round lots of Foundry Iron, but as no one wishes to contract ahead no prices are made. The market is in a demoralized condition. There is no movement in Charcoal Iron. Quotations are as follows:

Southern Coke, No. 1	$10.25 @	$10.60
Southern Coke, No. 2	9.50 @	9.75
Southern Coke, No. 3	9.25 @	9.50
Ohio Soft Stone Coal, No. 1	14.50 @	15.50
Ohio Soft Stone Coal, No. 2	14.00 @	14.50
Lake Superior Coke, No. 1	12.50 @	13.00
Lake Superior Coke, No. 2	11.50 @	12.00
Hanging Rock Charcoal, No. 1	17.0 @	17.50
Hanging Rock Charcoal, No. 2	16.50 @	17.00
Tennessee Charcoal, No. 1	13.00 @	13.50
Tennessee Charcoal, No. 2	12.00 @	12.50
Standard Southern Car Wheel	16.25 @	17.00
Lake Superior Car Wheel and Malleable	16.25 @	16.75

Advices from Birmingham, Ala., indicate that sales have been quite brisk and shipments exceeded the make largely. There are but few grades to be had there One large concern have nothing but No. 1 Foundry on hand and ten days' shipments will clean them up. Nos. 1 and 2 Soft are very scarce, as are in fact all the lower grades. Higher prices are looked for inside of 60 days. Quotations range No. 1 Foundry, $8; No. 2, $7 @ $7.25; No. 3, $6.75.

Metal Market.

Pig Tin. — On market prices of Straits Tin there has been a decline during the week of nearly ¼¢ ℔ lb for delivery this month, July or August. Sales to consumers have not, however, been above a very ordinary average for this season of the year, and jobbing prices for small lots have ruled about the same as last week's quotations—namely, 20¾¢ @ 21¢ ℔ lb. Slow trade here and lower prices in London along with the large visible supply of the metal account in a good measure for the decline in wholesale prices.

Copper.—The market has remained extremely quiet. The demand from all quarters has been unusully slow, and hardly enough business has been done to fairly determine market values. Jobbers' prices for small lots of Lake Ingot remain unchanged at former quotations, but the cheaper classes are to be had at some concessions.

Sheet Copper. — The demand for Sheet Copper has shared in the extreme dullness which pervades the Metal trade generally. Sales have been below the average, and inquiries limited in volume. Prices remain steady at their former level.

Pig Lead.—The proposed reduction in duty on foreign Lead has prompted the offering of domestic at a slightly lower figure than last week's quotations. Little business is doing, however, consumers being evidently inclined to go slow in the matter of buying until the tariff is settled. Deliveries are somewhat backward, and that fact tends to strengthen the belief in recent reports of restricted production. Jobbers ask for small lots of American Pig from 3⅝¢ to 3¾¢ ℔ pound.

Lead Pipe and Sheet.—There is next to nothing doing in Manufactured Lead, inquiries and sales being alike confined to very moderate proportions. Prices were revised last week, and remain firm at the reduced rates.

Spelter.—Sales have been moderate. The demand has shown very little spirit, although probably better than during the fortnight preceding the week under review. A certain amount

of reserve in the offering was shown, the inference from which is that late reports of modified production have some basis. Prices are firm, the common rate asked by jobbers for small amounts of Western being 4¼¢ ₱ lb.

Antimony. — Dealings have been moderate, and prices are barely steady. For small lots jobbers' rates are about 10¾¢ for Cookson's and 10¢ for Hallett's.

Tin Plates.—The Tin Plate market has proved no exception to the rule of apathy which has characterized the Metal trade in general during the week. In the earlier days business was like that of last week—spasmodic and below the average for the season—but toward the end of the week it relapsed into absolute tameness. No improvement has developed in the demand for either spot or forward shipments. Consumers are pursuing the policy of the greatest caution in buying, and as a general rule order not a box beyond the exact quantity necessary to fill their current requirements. Reports of better values in the English markets have not affected the domestic market to any appreciable extent. Stocks of imported Plates in bond are ample for the present demand in nearly all lines. Prices remain almost stationary, but with rather soft undertone on spot goods.

A special London cable despatch to *The Iron Age* of June 27 reports as follows in regard to the British Tin Plate market: The demand for Coke Tin Plate has been moderately active, with good orders from 'Frisco at somewhat enhanced prices. Buyers and sellers are still so far apart that business is chiefly of a retail character. Ternes have been in good demand, but prices show no further change. Swansea prices are as follows:

Bessemer Cokes, 14 x 20	@ 10/3
Siemens Cokes, 14 x 20	@ 10/6
Ternes, double box	@ 13/
Charcoals	13/ @ 15/

Sheet Iron.—Notwithstanding the restriction of production in both Black and Galvanized Iron, owing to the closing down of many mills from lack of fuel, strikes, &c., the supply of Sheet Iron, except in the case of Black Sheets for tinning, appears to be fully adequate to the demand, which is reported as very moderate. Prices are still down to rock bottom and show, as yet, no rising tendency. Galvanized Iron in small lots from store is quoted at 75 @ 75 and 5 % off.

Chicago Report.

Scrap.—Dealers continue to quote the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c.	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5⅛¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Business is beginning to improve again. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch
Chicago, Ill	$5.25	$5.50
Milwaukee, Wis	5.25	5.50
Kansas City, Mo	8.45	8.70
Council Bluffs, Iowa	8.45	8.70
Lincoln, Neb	8.60	8.85
Sioux City, Iowa	8.45	8.70
Aberdeen, S. Dak	8.50	8.75
Dubuque, Iowa	6.55	6.80
Madison, Wis	6.75	7.00
St. Paul, Minn	7.75	8.00
Burlington, Iowa	6.75	7 00
Des Moines, Iowa	8.20	8.45
Davenport, Iowa	6.55	6.80
St. Joseph, Mo	8.45	8.70
Leavenworth, Kan	8.45	8.70
Omaha, Neb	8.45	8.70

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

Trade Notes.

THE CANADIAN MINERAL WOOL COMPANY of Toronto, Canada, have secured a suitable factory at Dundas, Ontario, where they will have the necessary facilities for making the crude material which they have heretofore imported from the United States. The slag which they use will be brought from the Iron blast furnaces at Tonawanda, N. Y., until the blast furnace now being built at Hamilton, Ontario, is put in operation. The company are reported as enjoying a large sale for their mineral wool.

THE EXCELSIOR STEEL FURNACE COMPANY, 38 West Monroe street, Chicago, take up the subject of Register Flanges in their advertisement in this issue. Cuts are printed of both Square and Circle Top Flanges. These are made in all sizes and in both IC and IX weights. They are manufactured by special machinery built for the purpose and patented.

IN OUR ADVERTISING COLUMNS the Geuder & Paeschke Mfg. Company of Milwaukee, Wis., call attention to their line of Coal Hods, which they make in all sizes and styles, open or with funnels, japanned or galvanized and with gold bands or fancy decorations, as may be desired. The Hods have been entirely remodeled for this year's trade, are of pleasing design, very durable and are offered at prices which cannot fail to attract purchasers. All inquiries receive prompt and courteous attention.

It is reported from Boston that 300 acres on the Mystic River have been bought by New York capitalists, and that substantial docks will be built along the whole distance of the water front—1½ miles—where there is now a depth of 28 feet at low tide and of 37 feet at high tide. It is further rumored that the Nova Scotia Coal Syndicate will make the new docks their central depot for the United States.

The promptness with which the monthly statements of the imports and exports of the United States are now issued by the Treasury Department is much appreciated by the business community. The promulgation of early information on this subject adds much to its value.

CONDITION OF THE

Hardware Trade.

THE CLOSING DAYS of June are probably among the most quiet of the year, and, as is to be expected, the volume of business is light. Travelers for the most part are at home, some of them making arrangements to re-enter the field early next month. Merchants are as a rule buying only such goods as they require, and as a consequence both manufacturers and jobbers report business very light. Many of the factories are preparing to shut down for a time, as usual, in order to enable them to make repairs and improvements and get in shape for fall business. There is little to report in prices, the market being in substantially the same condition as for some time past. Collections are referred to as fair, though in some sections there is more or less complaint.

Advices from Chicago.—Trade in Shelf Hardware is not so active. Midsummer dullness appears to have made its appearance, and packing rooms are considerably quieter than they have been. No special changes have occurred in prices and no features of any special importance are coming up. Roofing plates are now in good supply, as importers have recently increased their stock considerably. Trade in Heavy Hardware has been good the whole of this month, but the past week's business was remarkably active. Small consumers have been buying very freely; orders have not been large, but numerous. The demand for wagon and carriage stock is steady and much better than usual, and many houses are behind their orders. It is worthy of note that in this line the demand is running to a better grade of material than ever before. Consumers are asking for better stock and superior finish and manufacturers and jobbers are obliged to comply with their wishes.

Notes on Prices.

Wire Nails.—The market in the matter of price is not entirely even. Some manufacturers are holding firmly at $1.10 for carload lots at mill, but others are making $1.05, and it is rumored that in some cases the latter figure has been slightly shaded. The demand is only moderate and the mills are beginning to close down. Small lots from store in New York are held at $1.25 to $1.30.

Advices from Chicago.—Manufacturers report trade quiet during the past week. A few orders have been influenced by the prospects of a general shut down of the factories on July 1, but merchants are not at all disposed to buy freely. Prices are maintained at $1.20 to $1.25, Chicago, for factory lots, while small lots are selling at $1.25 from stock.

Cut Nails.—There has been little change in the Cut Nail market during the past few weeks, and it is still represented by the quotation of 95¢ to $1 for carload lots, delivered on dock in New York, but during the past week the former figure has been made a little more freely than heretofore. Some relatively low quotations have been made by Western mills who are desirous of placing goods in Eastern territory, and this competition has the effect of weakening the market somewhat. Small lots from store in New York are held regularly at $1.10 to $1.15.

Advices from Chicago.—Prices on factory shipments have been increased

to 95 cents on a 55-cent average from the local mill. The manufacturers are doing a good business and not complaining of its volume, but Eastern manufacturers appear to be getting absolutely nothing in this field. The Lakeside mill is still shut down, but the compsny expect to start at an early day, ss soon as a supply of coal can be obtalned. Small lots from stock are quoted by jobbers at $1.15.

Barb Wire.—As usual at this season, the demand is light and diminishing. Prices, which of late have been a little uneven, show signs of increasing weakness, and slightly lower quotations are made. It is probable that attractive orders could be placed at lower prices than have recently ruled. We quote for Four-Point Galvanized, delivered at the points named, as follows: Pittsburgh, $2.05 to $2.10 ; Cleveland, $2.10 to $2.15; Cincinnati or Allentown, $2.25 to $2.30; Chicago or New York, $2.25 to $2.30.

Advices from Chicago.— Manufacturers have lately been accumulating stock, as they are now soliciting orders with gusarantees of prompt shipments. While trade is light, there has been no change in prices. Factories will generally shut down July 1, and consequently it is expected that they will be able to maintain quctations for some time. Jobbers quote small lots of Galvanized at $2.35 to $2.40, while carloads are selling at $2.20 to $2.25.

Enterprise Grater No. 93.—This article is put on the market by the Enterprise Mfg. Company of Pennsylvania, Philadelphia, Pa., for whom J. C. McCarty & Co. are agents, 97 Chambers street, New York. The Grater is sold at $3 list, subject to a discount to the trade of 20 per cent.

Juice Extractor No. 21. — Enterprise Mfg. Company of Pennsylvania, Philadelphia, Pa., for whom J. C. McCarty & Co., 97 Chambers street, New York, are agents, are putting this article on the market. It is sold to the trade at $2.50 list, subject to a discount of 20 per cent.

Monitor Aluminum Juice Extractor. — This Extractor is manufactured by the Sterling Aluminum Company, 1195 Fulton street, Brooklyn, who are selling it to the trade at $5 per dozen, net. The company are selling Glass Extractors of the same pattern at 85 cents per dozen, net. Referring to the use of aluminum in lemon juice extractors, the company advise us that they have recently received a letter from Prof. James W. Richards of Lehigh Universlty, in which he states that aluminum is a better material than glass for this purpose.

Ideal Dampers.—An illustrated description of these goods, which are a recent addition to the manufactures of the Stover Mfg. Company, Freeport, Ill., was given in our issue of 16th inst. These Dampers are sold to the trade at a discount of 50 per cent. from the following list:

4	4½	5	5½	6	7	inch.
$1.00	$1.13	$1.25	$1.38	$1.50	$2.00	per doz.

Glass.—The demand for Glass during the past week has not shown the activity anticipated by the manufacturers. Buyers are pursuing a conservative policy and purchasing only for immediate requirements, as the outlook does not justify anticipating the future. Glass factories not already closed down will discontinue operations on June 30 for the summer, and the opinion is expressed that the accumulated stock will be insufficient to supply the demand until fall. It is estimated that if the tariff bill passes in its present form foreign Window Glass can be imported at a discount of 88 per cent., and that the foreign article would then become a sharp competitor of American Glass. The general tendency of the market is still firm, Pittsburgh factory quotation being 85 per cent. discount. The demand for American Plate Glass is reported as encouraging at 70 and 10 per cent. discount.

Old Metals.—Business in Old Metals shows but very little more activity. Rather more inquiry for certain varieties of Scrap Iron is noted, and a few fair sales have been made, but they have not been sufficient to affect prices, which continue low. The following quotations represent about the current prices psid by New York dealers:

Heavy Copper	℔ lb	6¾¢
Light and Tinned Copper	℔ lb	6 ¢
Heavy Brass	℔ lb	4½¢
Light Brass	℔ lb	3¾¢
Lead	℔ lb	2½¢
Tea Lead	℔ lb	2¼¢
Zinc	℔ lb	2 ¢
No. 1 Pewter	℔ lb	12 ¢
No. 2 Pewter	℔ lb	6 ¢
Wrought Scrap Iron	℔ gross ton	$8.00
Heavy Cast Scrap	℔ gross ton	7.00
Stove Plate Scrap	℔ gross ton	3.50
Burnt Iron	℔ gross ton	2.50

Old Rags, Paper, &c.—The market for these materials continues very quiet and prices rule low. The following are the current rates paid in New York:

No. 1 White Rags	℔ lb	3¼	@	3⅜¢
No. 2 White Rags	℔ lb	2	@	2¼¢
Mixed Rags	℔ lb			¾¢
Blues and 3ds	℔ lb	1	@	1¼¢
Hard Sized White Shavings	℔ lb	2⅛	@	2⅜¢
No. 1 White Book Shavings	℔ lb	1¾	@	2⅛¢
No. 2 White Book Shavings	℔ lb	1⅛	@	1½¢
Light Book Shavings	℔ lb			¾¢
No. 1 Mixed Shavings	℔ lb	1	@	1¼¢
No. 2 Mixed Shavings	℔ lb	¾	@	1 ¢
No. 1 Printed Books	℔ lb	1	@	1¼¢
Ordinary Mixed Books	℔ lb	⅛	@	¾¢
Newspapers	℔ lb			2-5¢
No. 1 Manila Paper	℔ lb	¾	@	1 ¢
No. 2 Manila Paper	℔ lb	⅞	@	¾¢
Bogus Paper	℔ lb			⅛¢
Common Paper	℔ lb			⅜¢
Straw Chips	℔ lb			⅛¢
Binders' Clippings	℔ lb			⅛¢
Jute Butts	℔ lb			1⅛¢
No. 1 Jute Bagging	℔ lb			1 ¢
Mixed Bagging	℔ lb	¾	@	1 ¢
No. 2 Bagging	℔ lb	½	@	¾¢
Hemp Twine	℔ lb	2	@	2½¢
Manila Rope	℔ lb	2½	@	2½¢
Jute Rope	℔ lb	1½	@	1⅝¢
Mixed Rope	℔ lb	¾	@	⅞¢

Old Rubber.—There has been quite a marked improvement in the market for Old Rubber in this section, and prices have advanced for some descriptions. Dealers' purchasing prices, New York delivery, are as follows:

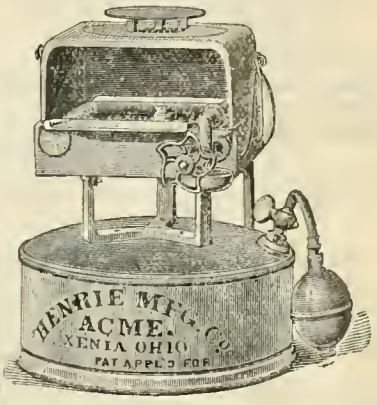
Car Springs, ton lots, ℔ lb.	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.04⅜
Rubber shoes, less than carloads, ℔ lb.	@	.04
Large Hose, ℔ ton	@	15.00
White Wringer Rolls, ℔ lb.	@	.03¾
White Syringes, ℔ lb	@	.03¾

Overhead electric wires in the crowded parts of Boston have been ordered down and to be placed underground. This order affects the street railway, telegraph, telephone and electric light companies, who are given until November next to complete the work.

It is reported that the New Hampshire Legislature will consider a proposal to build an electric road through the entire length of the State, beginning at Haverhill and terminating at Quebec, Canada.

Gasoline Soldering Furnace.

The Henrie Mfg. Company, Xenia, Ohio, are introducing to the trade an improved gasoline soldering furnace, shown in the accompanying illustration. Among the especial features of merit claimed for it by the makers is that the needle point is so guarded and arranged that draft cannot blow the gas away from the mixing chamber. It is also pointed out that it has what is termed return burners, which burn equally on both sides of heating chamber. Furthermore, its construction provides exceptionally large space for heating, and is especially adapted for cross seam or bottom irons on this account. For plumbers' service it is arranged so that no additional expense is necessary for hood or other device. When it is desired to melt solder a movable cap and loose ring are removed from the top of the heating hood and the pot placed thereon. The cast iron return burners



Gasoline Soldering Furnace.

are so arranged that solder cannot clog them, while they burn from both sides evenly, the flames meeting in the center, producing a very hot fire. The furnace will melt lead and heat coppers at the same time, the burners being large enough to heat three irons at once.

The members of the New York and New Jersey Bridge Commission, recently nominated by the President, held their initial meeting in the Army Building, New York, on Monday. The commission is composed of the following members: Major C. W. Raymond of the Corps of United States Engineers; Theodore Cooper and Prof. W. H. Burr of Columbia College, New York; George H. Morrison, Chicago, and G. Bouscaren, Cincinnati, Ohio. Major Raymond was elected president of the board and Mr. Cooper secretary. Charles Swan, secretary and treasurer of the Bridge Company, appeared before the board and presented the bridge plans, which will be taken into immediate consideration by the commission, whose first duty will be to determine the length of the new bridge's span.

United States Consul-General Ramon Williams, at Havana, reports to the State Department that a cablegram received there from Madrid states that the budget presented to the Spanish Cortes by the Colonial Minister of Cuba, to go into force on July 1, imposes a temporary import duty of 24 per cent. on all articles of American production now exempted by Schedule A of the reciprocity agreement between Spain and the United States.

Metal and Miscellaneous Prices.

CHICAGO, JUNE 28, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Celland and MetynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

Steel Coke—IC, 10x14, 14x20	@ $5.60
IC, 14x20, 90 ℔	@ 6.35
IC, 14x20, 100 ℔	6.50 @ 6.65
10 x 20	@ 8.50
20 x 28	11.30 @ 11.50
IX, 10x14, 14 x 20	@ 7.25
D.V. Grade. IC, 10x14, 14x20	5.75 @ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC, 14 x 20	@ $5.50
20 x 28	@ 11.00
IX. 20 x 28	@ 14.00
Worcester Brand and equal.—	
IC, 14 x 20..	6.12½@ .....
IC, 20 x 28..	12.25 @ .....
IX, 14 x 20..	7.62½@ .....
20 x 28..	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.66
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20	$7.00
IX, 10 x 14, 12 x 12, 14 x 20	9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.60
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
IC, 20 x 28	12.50

Roofing Plates.

Palm, IC, 20 x 28	@ $11.50
Palm, IX, 20 x 28	@ 14.00
Empire, IC, 20 x 28	@ 12.00
Empire, IX, 20 x 28	@ 15.00
Hickory, IC, 20 x 28	@ 12.50
" IX, 20 x 28	@ 15.50
Alaska (heavily coated), IC, 20x28	@ $14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 14.75
" IX, 20 x 28	@ 17 25
Westmoreland:	
IC, 14 x 20	$6.00
IC, 20 x 28	12.00
Elwood:	
IC, 20 x 28	$11 50
Kenwood:	
IC, 20 x 28	$11.50
Furmston:	
IC, 20 x 28	$11.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.60
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00
Old Process:	
IC, 14 x 20	9.00
IX, 14 x 20	11.00
IC, 20 x 28	18.00
IX, 20 x 28	22.00
H. B. L., Old Style:	
IC, 14 x 20	7.75
IX, 14 x 20	9 25
IC, 20 x 28	15.50
IX, 20 x 28	18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 3-10¢	3 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5-10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢: B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata, or first quality.....dis. 75@5%

Copper—

Ingot.

Lake.....10¼¢ @ 10⅝¢
Casting Brands.....9¾¢ @ 10⅛¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.33
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.33
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	50 advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter.....4¢

Sheet Zinc—

600 ℔ casks.....4⅝¢
800 ℔ casks.....4⅞¢
Loose sheets.....5½¢

Lead—

Soft Pig Lead.....4 ¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½@½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12½¢
Hallett's.....11½¢

Wrought-Iron Pipe—

1¼ and under, Plain	57½%
1¼ and under, Galv	50%
1½ and over, Plain	67½%
1½ and over, Galv	57½%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Ahendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benaline	7½@8 ¢
Iron Paint, Bright Red	℔ ℔, 2 ¢
" " Brown	℔ ℔, 1½¢
" " Purple	℔ ℔, 2½¢
" Ground in oil, B. Red	℔ ℔, 6½¢
" Ground in oil, Red	℔ ℔, 6½¢
" Ground in oil, Brown	℔ ℔, 6½¢
" Ground in oil, Purple	℔ ℔, 6 ¢
Linseed Oil, Boiled, in bbls	56¢@58¢
Linseed Oil, Raw, in bbls	55¢
Mineral Paints	2@4¢
Orange Mineral	9½¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5½¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls. ℔ gal	84¢
Spirits Turpentine, in bbls., ℔ gal	86¢ @36½¢
Asphaltum, Trinidad Refined, ℔ ton	$...
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, JUNE 29, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots

Small lots	℔ ℔, 65¢
100-℔ lots	℔ ℔, 63¢
Ton lots	℔ ℔, 60¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots	℔ ℔, 63¢
100-℔ lots	℔ ℔, 60¢
Ton lots	℔ ℔, 55¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	℔ ℔, 60¢
100-℔ lots	℔ ℔, 55¢
Ton lots	℔ ℔, 50¢

Antimony—

Cookson	℔ ℔, 10½¢
Hallett's	℔ ℔, 10¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List April 9, 1894.

Plain Round Tube.	Per ℔.
¼ in. up to 2-in	$3.35
⅜-in. up to ½-in	.56
½-in. up to ⅝ in	.48
⅝-in. up to ¾-in	.41
5-16-in. up to ⅜ in	.48
¼ in. up to 5-16 in	.65
3-16-in. up to ¼-in	1.00
⅛-in. up to 3-16-in	1.50
Smaller than ⅛-in.	Special
½ and larger	Special
½ to 3 in., to No. 16, inclusive	.38

25 @ 35%

Copper and Bronze Tubing—

½¢ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized	50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ℔ ℔, net

Ingot.

Lake	10½¢
Ansonia Grade Arizona	10 ¢
Ansonia Grade Casting	9½¢
Planished	net
Sheet and Bolt	15¢ ℔ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized	60&10%
Lap or Slip Joint Terne	60%

Eave-Trough Mitres—

Lap or Slip Joint	list, net

Elbows—

Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized	35%

Stove-Pipe—

Buffalo Four-Piece.

4¼	5	5¼	6	7 inch.
$0.78	.87	.90	.99	1.20 per doz.

20 %

Elbows and Shoes—

Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.

Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	2.80¢	
Nos. 17 to 21	℔ ℔, 2.60	2.90¢
Nos. 22 to 24	℔ ℔, 2.70	3.00¢
Nos. 25 and 26	℔ ℔, 2.80	3.10¢
No. 27	℔ ℔, 2.90	3.20¢
No. 28	℔ ℔, 3.00	3.30¢
American E. B.	℔ ℔, 4¢@4¼¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11¾@12¾¢
Patent Planished....℔ ℔, A, 10¢: B, 9¢, 5%
Craig Polished Sheet Steel.....℔ ℔ 8¼¢

Galvanized.

	B. B.
Nos. 10 to 16	75@75&5%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig	3½¢@3¾¢
Bar	4½¢
Pipe	5¼¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	35¢, 20%
Sheet	6¼¢, 20%

Old Lead in exchange, 2¼¢ ℔ ℔.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7 ½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil:	
Raw, ℔ gal	@ .50
Boiled	@ .53
Spirits Turpentine:	
In bbls	@ .36
Putty:	
In barrels and ½ bbls	.01¾ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01½ @ .02⅛
In bladders	.01⅞ @ .02¼

Roofing Material, &c.:

Asphaltum, Trinidad Refined, ℔ ton	$30.00@$35.00
Asphaltum, Rock, ℔ ton	$14.00
Coal Tar Felt, 1 Ply, ℔ ℔	2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft.	$1.85
Roofing Pitch, ℔ bbl	$3.25